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TITLE: "Relationship Factors Contributing to the Progression of Combat Related PTSD and Suicidality Over Time"

*Note: The public title used in IRB and with participants is, "Relationships Among Military Personnel (RAMP) Project".*

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# REPORT DOCUMENTATION PAGE

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<b>13. SUPPLEMENTARY NOTES</b>											
<b>14.</b> The RAMP project was designed to examine the key social context of intimate romantic relationships of active duty Army soldiers, and how interpersonal processes in this type of relationship can affect psychological functioning over time. The ultimate goal of this knowledge is to inform programs and therapies for military couples. This study consisted of confidential online surveys, which were completed by active duty Army males post deployment, along with their significant romantic partner. The study consisted of a total of 5 surveys each for the service members and their female partners. Final participation rates are as follows: 1430 individuals (i.e., 715 couples) passed screening and were invited to complete Survey 1 and 1242 individuals (576 matched couples) completed Survey 1. Survey 1 served as a further screen for valid responding and PTSD symptoms. After this screen, 554 individuals (277 couples) were invited to complete surveys 2 through 5. 537 individuals (263 matched couples) completed Survey 2. 519 individuals (224 matched couples) completed Survey 3. 510 individuals (241 matched couples) completed Survey 4. 499 individuals (233 matched couples) completed Survey 5. Response rates (on the individual level) for the 5 surveys are as follows: 87% for Survey 1, 97% for Survey 2, 94% for Survey 3, 92% for Survey 4, and 91% for Survey 5. Throughout the five years of the study, we have disseminated emerging results at regional or national conferences, with manuscripts under review or preparation now that data collection is complete.											
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## Introduction

This report highlights the progress and accomplishments of “Relationship Factors Contributing to the Progression of Combat Related PTSD and Suicidality Over Time” throughout our five years of funding from March 2, 2012 to March 1, 2017. Please note that the public title we selected for use in IRB review, with our participants, and throughout this report is the “Relationships Among Military Personnel (RAMP) Project”. The RAMP project was designed to examine the key social context of intimate romantic relationships of active duty Army soldiers, and how interpersonal processes in this type of relationship can affect psychological functioning over time. The ultimate goal of this knowledge is to inform programs and therapies for military couples.

The study consisted of a total of 5 surveys each for male service members and their female partners. Final participation rates are as follows: 576 couples completed Survey 1, 263 couples completed Survey 2, 224 couples completed Survey 3, 241 couples completed Survey 4, and 233 couples completed Survey 5.

Primarily due to initial setbacks in recruitment that led to a delay in enrolling participants, we completed requests for two No Cost Extension (NCE) years during this study. The two NCE years extended the project for an additional 24 months (through 02-28-17). We received continual annual approval from COMIRB and HRPO for our research efforts throughout the study. We maintained an active research team, including volunteer undergraduate research assistants, staff, and subcontracted consultants and co-investigators. Initial dissemination efforts include 15 posters and 7 talks at regional and national conferences (see Appendices). We have not published any findings yet, but are developing manuscripts for publication and will continue to do so after the conclusion of the funded study period.

The specific aims for the RAMP project are:

- Aim 1:** To examine couple and partner responses to PTSD symptoms, and how these responses affect PTSD, relationship functioning, and psychological risk factors for suicide over time.
- Aim 2:** Examine additional PTSD and relationship predictors of psychological risk factors for suicide.
- Aim 3:** Assess mechanisms of the relationship between PTSD and relationship functioning over time.
- Aim 4:** Determine adaptive and maladaptive patterns of communication regarding combat.

## Body

In our approved Statement of Work, we proposed eight general task categories to accomplish our specific aims:

1. Hiring and orientation of project staff, purchasing and installing equipment
2. Finalizing initial item pool
3. Creating IRB applications, obtaining initial IRB approval, and maintaining compliance
4. Finalizing surveys
5. Developing and maintaining study materials and infrastructure
6. Recruitment
7. Executing online surveys
8. Analysis and dissemination

A narrative of significant accomplishments, issues encountered, and synopsis of key milestones for each year related to these SOW task categories 1-8 are provided in Sections I – IV. Following these annual narratives, bulleted lists of key accomplishments are provided in the next section, *Key Accomplishments*, which are organized by task category and year.

### I. First Year (March 2, 2012 – March 1, 2013)

During this first year of the project, the principal investigator (PI) began assembling the study team. The study team began to develop the surveys, protocol, recruitment materials and website, participant communications, and participant payment processes. The study passed initial reviews by the University of Colorado Institutional Review Board (COMIRB), US Army Medical Research & Materiel

Command (USAMRMC) Human Research Protection Office (HRPO), and NIMH Certificate of Confidentiality (COC) program.

Key milestones this year:

- **FY11, Yr1 Q1, 03-07-2012:** Grant kickoff meeting and conference call with funding agency.
- **FY11, Yr1 Q1, 06-22-2012:** Created and submitted a pre-review packet to our TATRC regulatory compliance specialist, Brigit Ciccarello.
- **FY11, Yr1 Q1, 06-30-2012:** All subcontracts and consultant billing procedures finalized.
- **FY12, Yr1 Q2, 07-13-2012:** Received and responded to pre-review feedback from our TATRC regulatory compliance specialist.
- **FY12, Yr1 Q2, 08-05-2012:** Dr. Keith Renshaw, a collaborating researcher on the project, received IRB approval from George Mason University to pilot a measure for the study entitled "Psychological Experience and Impressions of Behavior".
- **FY12, Yr1 Q2, 09-24-2012:** Submitted protocol and necessary attachments to COMIRB for initial approval. This included drafts of full protocol, consent form, recruitment ads, website content, and measures.
- **FY12, Yr1Q3, 11-09-2012:** Held a Key Informant meeting in Colorado Springs, CO.
- **FY12, Yr1Q3, 12-14-2012:** Obtained initial COMIRB approval for the study (submitted in September, 11/1/12 submitted a detailed response and revisions, 11/7/13 PI attended COMIRB full board review meeting, 12/4/12 submitted COMIRB request for minor modifications).
- **FY12, Yr1 Q3, 12-20-2012:** Submitted protocol and necessary attachments to HRPO for approval.
- **FY13, Yr1 Q4, 02-07-2013:** Completed the Certificate of Confidentiality application and received feedback from the COC coordinator; minor revisions were requested and necessary revisions were made,
- **FY13, Yr1 Q4, 02-26-2013:** Received confirmation that HRPO determined that the project complied with all applicable federal, DOD, and USAMRMC human subjects protection regulations.

## II. Second Year (March 2, 2013 – March 1, 2014)

In this report period, the study team obtained approvals from the University of Colorado Denver COMIRB as well as HRPO. We obtained a Certificate of Confidentiality from the National Institutes of Health. The RAMP Project officially opened to participants on June 17, 2013. Launching the study included publishing the official RAMP website (<http://www.RAMPproject.net> or [www.armycouples.com](http://www.armycouples.com)), which allowed participants to take the online Eligibility Enrollment survey, and making the RAMP Facebook page accessible.

As of March 1, 2014, 1531 individuals completed the eligibility screening, 500 (250 couples) individuals were deemed fully qualified and were sent Survey 1 invitations, 418 participants (including 199 matched couples) completed Survey 1; 158 Survey 2 invitations were sent (79 couples), 156 participants completed Survey 2 (including 77 matched couples).

We oriented 11 volunteer undergraduate research assistants throughout the year to help with recruitment, data management, and survey building within Qualtrics. We also hired a paid consultant to help specifically with military recruitment and advisement. All subcontracts were kept up to date. The study team put in extensive efforts for recruitment, as recruiting proved much more difficult than initially anticipated. We used a variety of low cost or free strategies to recruit, and continued to receive consultation on this issue and expand our strategies. The team also created comprehensive screening processes for fraudulent responders, detailed protocols for data checking and downloading, and ethics training for all study personnel (e.g., general human subjects certification, documented agreement to specific ethical practices regarding this study).

As we continued to adapt the study to expand recruitment processes, change eligibility criteria, refine measures, or similar tweaks to the study, we submitted 3 University of Colorado Institutional Review Board (COMIRB) amendments during this time and received subsequent approval. With each COMIRB amendment, we notified the compliance officer at HRPO, and none were considered a modification. The study received annual approval from COMIRB and the US Army Medical Research & Material Command (USAMRMC) Human Research Protection Office (HRPO) for our continued efforts.

Key milestones this year:

- **FY13, Yr2 Q1, 03-08-2013:** Submitted to COMIRB an amendment to include updated language incorporating the Certificate of Confidentiality and suggested changes from DOD's HRPO, for their review.
- **FY13, Yr2 Q1, 03-22-2013:** Approved survey measures allocated for each time point, gender, and contingency (e.g., leaving army, break-up, etc.).
- **FY13, Yr2 Q1, 04-05-2013:** Received approval from COMIRB on amendment.
- **FY13, Yr2 Q1, 04-08-2013:** Submitted the approved, revised documents we received from COMIRB to HRPO for review.
- **FY13, Yr2 Q1, 04-16-2013:** Received HRPO approval.
- **FY13, Yr2 Q1, 05-06-2013:** Received final Certificate of Confidentiality (COC) approval.
- **FY13, Yr2 Q1, 05-15-2013:** PI attended the Suicide Prevention Research Portfolio's In Progress Review (IPR) Meeting in Frederick, MD to learn about studies that are currently being funded in the area of suicide prevention.
- **FY13, Yr2 Q1, 06-13-2013:** Received final approval to renew the University of Denver and George Mason University's subcontracts with the University of Colorado Denver's Office of Grants and Contracts.
- **FY13, Yr2 Q1, 06-14-2013:** Finalized internal protocols that delineate specific instructions of how the RAMP team verifies eligibility status, invites eligible and interested participants into Survey 1 (Phase 1) and Surveys 2 – 5 (Phase 2), and how to provide compensation to participants upon completion of surveys.
- **FY13, Yr2 Q1, 06-17-2013: Recruitment opens.** The RAMP study team officially launched their website (<http://www.RAMPproject.net>), Facebook page (<https://www.facebook.com/TheRAMPPProject>), and online Eligibility Enrollment survey.
- **FY13, Yr 2 Q2, 07-08-13:** Submitted COMIRB amendment that included the option to expand our criteria for participation and our recruitment methods, updated measures, and similar refinements to the study.
- **FY 13, Yr2 Q2, 07-30-13:** Received approval from COMIRB on previously mentioned amendment.
- **FY13, Yr2 Q3, 10-09-13:** Hired a new consultant on the project to assist with recruitment.
- **FY13, Yr2 Q3, 10-28-13:** Submitted COMIRB annual continuation form.
- **FY 13 Yr2, Q3, 11-21-13:** Submitted COMIRB amendment that refined some items and updated recruitment content.
- **FY13, Yr2 Q3, 12-6-13:** Received approval from COMIRB for annual continuation form.
- **FY13, Yr2 Q3, 12-27-13:** Received approval from COMIRB on previously mentioned amendment.
- **FY14, Yr2 Q4, 01-29-2014:** Submitted materials and received acknowledgement of annual continuation of the study from HRPO.
- **FY14, Yr2, Q4, 02-12-14:** Submitted a COMIRB amendment to obtain approval for a press release to be released by the University of Colorado Denver about the study.
- **FY14, Yr2, Q4, 03-01-14:** As of March 1, 2014: 1531 individuals completed the eligibility screening, 500 (250 couples) individuals were fully qualified and have been sent Survey 1 invitations, 418 participants (including 199 matched couples) have completed Survey 1, 158 Survey 2 invitations have been sent (79 couples), 156 participants have completed Survey 2 (including 77 matched couples).
- **FY14, Yr2, Q4, 03-01-14:** Submitted three poster submissions for acceptance at the 2014 Association of Behavioral and Cognitive Therapies (ABCT) using data from this study.
- **FY14, Yr2, Q4, -3-01-14:** From the beginning of recruitment (6/17/14) to March 1, 2014, our recruitment efforts include:
  - (a) online classified ads (including those that target the military population)
  - (b) advertising on Army Wife Network, MilitaryWives.com, and Army Wife 101
  - (c) Two separate blog postings on SpouseBuzz based on an interview with PI
  - (d) circulation of an announcement for the study by Bill Coffin in various online military sites
  - (e) posting the study in various psychological research, military, and couples sites

- (f) snowball sampling;
- (g) direct outreach to FRGs, USOs, WRC, ACS, Chaplains
- (h) outreach to professional psychological organizations and military support organizations (e.g., ABCT- Military Psych Special Interest Group, Family Advocacy Program Coordinators, Yellow Ribbon Reintegration State Program Specialists, Family Readiness Division Coordinators/Liaisons; Military Family Research Institute, Military Suicide Research Consortium)
- (i) posting comments on related media articles
- (j) Facebook ads directed towards the population of our study
- (k) Blue Star newsletter
- (l) news articles in Killeen Herald and on Military.com about our study with an interview from the PI

### III. Third Year (March 2, 2014 – March 1, 2015)

During this report period, we completed recruitment for the study. From the opening of recruitment through the current year, we invited a total 719 couples to complete Survey 1. Of those invited, 593 couples completed Survey 1, which is an 82% response rate. After screening the initial sample for various factors, 281 couples were invited into Surveys 2 through 5. Response rates (on the individual level) thus far in this year were 98% for Survey 2, 94% for Survey 3, and 99% for Survey 4. Survey 5 was launched March 20<sup>th</sup>, 2015 and therefore response rates are not included in this annual summary. During this report period, we presented three posters at the Association of Behavioral and Cognitive Therapies (ABCT) 2014 conference and 1 poster at the Rocky Mountain Psychological Association 2014 Conference. We submitted three poster abstracts and four symposium abstracts for the 2015 ACBT Conference.

Primarily due to the setbacks in recruitment that led to a delay in enrolling participants, we completed a request for a No Cost Extension (NCE) year. We received subsequent approval for the NCE, which took place from March 1, 2015 – February 28, 2016.

Through this report period, we maintained an active research team, including volunteer undergraduate research assistants, staff, and subcontracted consultants and co-investigators. The team continued to refine and maintain detailed protocols for data checking and downloading, and ethics training for all study personnel (e.g., general human subjects certification, documented agreement to specific ethical practices regarding this study). As part of ongoing refinements and updates, 5 University of Colorado Institutional Review Board (COMIRB) amendments were approved during year three of the study. The US Army Medical Research & Material Command (USAMRMC) Human Research Protection Office (HRPO) was advised each time. The study received annual approval from COMIRB and HRPO for our continued efforts.

Key milestones this year:

- **FY14, Yr3, Q1, 03-03-14:** Survey 3 was launched.
- **FY14, Yr3, Q1, 03-03-14:** COMIRB approval for press release which was subsequently distributed.
- **FY14, Yr3, Q1 04-01-14:** Submitted Annual Report to the Office of the Assistant Secretary of Defense for Health Affairs and the United States Army Medical Research and Materiel Command (USAMRMC).
- **FY14, Yr3, Q1, 4-24-14:** Poster presented at the 2014 Rocky Mountain Psychological Association.
- **FY14, Yr3, Q1, 05-16-14:** Three posters accepted for the 48<sup>th</sup> Annual Convention of the Association for Behavioral and Cognitive Therapies, to be held in Philadelphia, PA in November, 2014.
- **FY14, Yr3, Q1, 06-30-14:** Recruitment completed.
- **FY14, Yr3, Q2, 07-21-14:** COMIRB approval for added items to surveys 4 and 5.
- **FY14, Yr3, Q2, 08-28-14:** Enrollment complete.
- **FY14, Yr3, Q2, 09-16-14:** Survey 4 launched.

- **FY14, Yr3, Q3, 10-17-14:** Received approval for a No Cost Extension from 3-1-15 through 2-28-16.
- **FY14, Yr3, Q3, 10-21-14:** Received approval from COMIRB to continue conducting research for another year, through 10-20-15.
- **FY14, Yr3, Q3, 10-27-14:** Received approval from COMIRB for amendment.
- **FY14, Yr3, Q3, 11-5-15:** Survey 2 complete.
- **FY14, Yr3, Q3, 11-21-14:** Completed and presented three sets of analyses as posters at the 2014 Association of Behavioral and Cognitive Therapies (ABCT) Conference in Philadelphia, PA.
- **FY15, Yr3 Q4, 01-28-15:** Received acknowledgement of annual continuation of the study from HRPO.
- **FY15, Yr3, Q4, 02-10-15:** Received approval from COMIRB for amendment.
- **FY15, Yr3, Q4, 03-09-15:** Submitted three poster submissions and four symposium submissions to the 2015 Association of Behavioral and Cognitive Therapies (ABCT).

#### IV. Fourth Year (March 2, 2015 – March 1, 2016)

During this report period, we completed data collection for Surveys 3 and 4. The totals that we built to by 3.1.16 were as follows. We have invited 716 couples to complete Survey 1. Of those invited, 593 couples participated in Survey 1, which is an 83% response rate. After screening the initial sample for various factors, 281 couples were invited into Surveys 2 through 5. Response rates (on the individual level) thus far were 98% for Survey 2, 94% for Survey 3, and 93% for Survey 4. Survey 5 was ongoing at the end of this reporting period, but the current response rate (on the individual level) was 88%.

We continued to maintain an active research team, including volunteer undergraduate research assistants, staff, and subcontracted consultants and co-investigators. The team continued to refine and maintain detailed protocols for data checking, downloading, and cleaning, and ethics training for all study personnel (e.g., general human subjects certification, documented agreement to specific ethical practices regarding this study). The study received annual approval from COMIRB and HRPO for our continued efforts. Initial dissemination efforts continued, including presenting three poster submissions and four symposium submissions at the 2015 Association of Behavioral and Cognitive Therapies (ABCT) conference.

Primarily due to the initial setbacks in recruitment that led to a delay in enrolling participants, we completed a request for a second No Cost Extension (NCE) year. We received subsequent approval for the second NCE, which took place from March 1, 2016 – February 28, 2017.

Key milestones this year:

- **FY15, Yr4, Q1, 03-20-15:** Survey 5 launched.
- **FY15, Yr4, Q1, 05-25-15:** Survey 3 now complete.
- **FY15, Yr4, Q1, 05-29-15:** Received acknowledgment of acceptance for three poster submissions and four symposium submissions to the 2015 Association of Behavioral and Cognitive Therapies (ABCT).
- **FY15, Yr4, Q2, 09-22-15:** Received certificate of approval from COMIRB to continue conducting research for another year, through 09-16-16.
- **FY15, Yr3, Q3, 10-7-15:** Completed subcontract renewals for all four of the subcontractors on this project.
- **FY15, Yr4, Q3, 10-24-15:** Survey 4 is now complete.
- **FY15, Yr4, Q3, 11-15-15:** Presented three posters and four symposium presentations at the 2015 Association of Behavioral and Cognitive Therapies (ABCT).
- **FY15, Yr4, Q3, 12-01-15:** Submitted four poster submissions and one symposium submission to the 2016 American Psychological Association (APA) Conference.
- **FY15, Yr4, Q3, 12-22-15:** Submitted a second No Cost Extension (NCE) request to extend the project for 12 months (through 02-28-17).
- **FY15, Yr4 Q4, 01-25-16:** Four poster submissions and one symposium submission accepted to the 2016 American Psychological Association (APA) Conference.

- **FY15, Yr4 Q4, 02-09-15:** Received approval for a second No Cost Extension from 3-1-16 through 2-28-17.
- **FY15, Yr4, Q4, 03-01-16:** Submitted two symposium submissions to the 2016 Association of Behavioral and Cognitive Therapies (ABCT).

V. Fifth Year (March 2, 2016 – March 1, 2017)

The RAMP project officially ended on February 28, 2017. During this final year, we completed survey 5, which is the final survey of the study. We continued dissemination efforts by presenting one symposium and three posters at the 2016 Association of Behavioral and Cognitive Therapies (ABCT) Conference, and we also submitted a manuscript to the Journal of Trauma and Dissociation, which was under review at the end of this reporting period.

We received COMIRB approval to conduct the research project for an additional year. We also received COMIRB approval on an amendment which refined our data storage and sharing processes. After the research team finished their extensive efforts in data cleaning to identify duplicate cases, incomplete surveys, etc., our final numbers of valid participants are: 1242 individuals participated in Survey 1, 537 individuals participated in Survey 2, 519 individuals participated in Survey 3, 510 individuals participated in Survey 4. Survey 4 is complete, 499 individuals participated in Survey 5.

Key milestones this year:

- **FY16, Yr5, Q1, 05-05-16:** Survey 5 (the final survey) is now complete.
- **FY16, Yr5, Q1, 05-13-16:** Received approval for one symposium and three posters to be presented at the 2016 Association of Behavioral and Cognitive Therapies (ABCT).
- **FY16, Yr5, Q2, 08-05-16:** Submitted annual COMIRB renewal application.
- **FY16, Yr5, Q2, 08-05-16:** Submitted a COMIRB amendment to refine our data storage processes.
- **FY16, Yr5, Q2, 09-12-16:** Received certificate of approval from COMIRB to continue conducting research.
- **FY16, Yr5, Q2, 09-12-16:** Submitted HRPO Continuing Review Submission Form and COMIRB IRB approval letter for the continuation of the study to HRPO.
- **FY16, Yr5, Q2, 09-30-16:** After working on data cleaning to identify duplicate cases, incomplete surveys, etc. to get better final participation rates, we eliminated some respondents based on these types of issues and ultimately coded individuals as having “participated” if they completed at least some of the survey. Thus, final participation rates are as follows:
  - 1242 individuals participated in Survey 1. Survey 1 is complete.
  - 537 individuals participated in Survey 2. Survey 2 is complete.
  - 519 individuals participated in Survey 3. Survey 3 is complete.
  - 510 individuals participated in Survey 4. Survey 4 is complete.
  - 499 individuals participated in Survey 5. Survey 5 is complete.
- **FY16, Yr5, Q3, 10-31-16:** Received approval from COMIRB for amendment to refine data storage and sharing processes. Per guidance regarding what to submit to HRPO for approval, this amendment was not forwarded due to the very minor nature of the amendment.
- **FY16, Yr5, Q3, 12-06-16:** HRPO acknowledged receipt of the continuing review documents for the protocol.
- **FY16, Yr5, Q3, 12-30-16:** Submitted a manuscript to the Journal of Trauma and Dissociation for review.

## Key Research Accomplishments

Below are our key accomplishments, organized by task category and then year.

Table 1. Hiring and orientation of project staff, purchasing and installing equipment.

First Year	<ul style="list-style-type: none"> <li>Graduate research assistants (GRAs) formally contracted, completed CITI Human Subjects and Social/Behavioral Research trainings.</li> <li>Computer access and phone lines set up.</li> <li>Hiring plan approved and hiring completed for Professional Research Assistant (PRA) and consultant.</li> <li>PRA completed CITI Human Subjects and Social/Behavioral Research trainings.</li> <li>Volunteer, undergraduate research assistants (RAs) brought onto the project; RAs completed CITI Human Subjects and Social/Behavioral Research trainings.</li> <li>Subcontracts developed.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>Maintain undergraduate RA staffing. All RAs who join the project complete CITI human subjects training and a confidentiality and ethical agreement for the lab.</li> <li>All subcontracts maintained.</li> <li>Consultant hired on to specifically help with recruitment.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>Maintain undergraduate RA staffing. All RAs who join the project complete CITI human subjects training and a confidentiality and ethical agreement for the lab.</li> <li>All subcontracts maintained.</li> <li>Hired, oriented, and trained an additional Graduate Research Assistant (GRA).</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>Oriented additional volunteer Research Assistant (RA) per processes noted above.</li> <li>All subcontracts maintained.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>Oriented additional volunteer Research Assistant (RA) per processes noted above.</li> <li>All subcontracts maintained.</li> </ul>

Table 2. Finalizing the initial item pool. -

First Year	<ul style="list-style-type: none"> <li>Ongoing measure identification, refinement, and development. Additional insights into novel items and constructs to consider measuring occurred after Key Informant meeting (held in Colorado Springs, CO).</li> <li>Full draft of the survey measure item pool completed and submitted to IRB. (This item pool to be refined and the finalized set of measures submitted to IRB as an addendum.)</li> <li>Level of review from co-investigators has included (a) optimal measures to achieve aims while keeping respondent burden manageable, (b) close review of measures per time point and partner to achieve planned analyses such as HLM with dyads, (c) final development of novel measures needed to fill gaps.</li> <li>Revised item pool submitted to COMIRB and approved 12/14/12.</li> <li>In consultation with all study investigators, survey measures approved and allocated for each time point, gender, and contingency (e.g., leaving army, break-up, etc.).</li> <li>Item pool refined and close to finalization.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>After the latest COMIRB approval, added measures and items to more effectively capture the aims of the study, help with validity checks, and track our participants longitudinally.</li> <li>Item pool completely finalized for surveys 1, 2, and 3. Item pools close to</li> </ul>

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	finalized for surveys 4 and 5.
Third Year	<ul style="list-style-type: none"> <li>Item pool completely finalized, tested, and implemented for surveys 1, 2, 3, 4, and 5.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>This task completed in prior periods.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>This task completed in prior periods.</li> </ul>

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Table 3. Creating IRB applications, obtaining initial IRB approval, and maintaining compliance.

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First Year	<ul style="list-style-type: none"> <li>Throughout this year, PI, GRAs, and RAs completed human subjects training.</li> <li>Compiled pre-review packet for TATRC regulatory compliance specialist to review.</li> <li>Received pre-review feedback from TATRC regulatory compliance specialist; study team attended to all comments and received additional consultation on military verification methods.</li> <li>Collaborating researcher, Dr. Renshaw, received IRB approval at George Mason University to test a measure that our study plans to use.</li> <li>Finalized application documents submitted to COMIRB.</li> <li>PI met with IRB to discuss protocol and address any questions.</li> <li>Received initial response of minor modifications; study team attended to all comments and suggestions provided by COMIRB, and re-submitted the protocol for full board review in December.</li> <li>Initial COMIRB approval obtained 12/14/12.</li> <li>Submission for USAMRMC HRPO review sent 12/20/12.</li> <li>Application for Certificate of Confidentiality (COC) completed.</li> <li>HRPO found project compliant with all applicable federal, DOD, and USAMRMC human subjects protection regulations.</li> <li>COC and HRPO review suggested minor changes. Materials and measures continued to be refined.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>Received final approval letter for the Certificate of Confidentiality (COC).</li> <li>As we continued to refine measures and protocols, repeatedly submitted revised documents to COMIRB and received subsequent approval. Submitted documents to HRPO for final review and received approval.</li> <li>Created an undergraduate research assistant protocol, including a confidentiality statement and an ethical adherence statement to ensure and maintain compliance with all staff, regardless of their role as official study personnel or not.</li> <li>Submitted annual continuation form to IRB/HRPO and received subsequent approval to continue our research efforts.</li> <li>All staff continues to maintain compliance with ethical and confidential standards of the lab and IRB.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>Obtained IRB approval for amendments, such as a press release to be circulated about the study, additional items to be added to surveys 4 and 5, and to update our personnel. Any IRB modification sent to HRPO for approval.</li> <li>Completed COMIRB annual report and received subsequent approval to continue to conduct research for another year. HRPO acknowledges continuation.</li> <li>All staff continues to maintain compliance with ethical and confidential standards of the lab and IRB.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>Obtained IRB approval for amendments. Any IRB modification sent to HRPO for approval.</li> </ul>

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	<ul style="list-style-type: none"> <li>Completed COMIRB annual report and received subsequent approval to continue to conduct research for another year. HRPO acknowledges continuation.</li> <li>All staff continues to maintain compliance with ethical and confidential standards of the lab and IRB.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>Obtained IRB approval for amendments.</li> <li>Completed COMIRB annual report and received subsequent approval to continue to conduct research for another year. HRPO acknowledges continuation.</li> <li>All staff continues to maintain compliance with ethical and confidential standards of the lab and IRB.</li> </ul>

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Table 4. Finalizing surveys for Phase 1 and Phase 2.

First Year	<ul style="list-style-type: none"> <li>Starting process of entering skip logic, prompts, and questions into Qualtrics (online survey provider).</li> <li>PI, collaborating researchers, and consultants working to distribute items across surveys based on time point and gender; careful attention being paid to the fulfillment of aims, abilities to conduct model testing, and respondent burden.</li> <li>PI and statistical consultant ensure measures appear at appropriate time points and presentations conducive to hypothesis model testing.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>Survey 1 and subsequent payment surveys officially launched on 06-17-13.</li> <li>Survey 2 completed and launched.</li> <li>Survey 3 built and tested in Qualtrics, almost ready to launch.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>Surveys 1 and 2 complete.</li> <li>Survey 3 and 4 completed and launched</li> <li>Survey 5 content is finalized and will be launched in late March 2015.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>Survey 1 – 4 complete.</li> <li>Survey 5 launched.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>All surveys complete.</li> </ul>

Table 5. Developing and maintaining study materials and infrastructure.

First Year	<ul style="list-style-type: none"> <li>Online resource and citation library created and made accessible to all project team members using Mendeley.</li> <li>Purchased Qualtrics survey provider and completed trainings</li> <li>Purchased website domain name, website images, and website development tools.</li> <li>Project manager built website.</li> <li>GRA, PRA, and consultant developing the specific military verification procedures.</li> <li>PI and project manager complete all applications, trainings, and authorizations for fiscal roles within the University.</li> <li>Full draft of all participant communications (e.g., invites, reminders, non-eligible for study) completed and ready for review.</li> <li>PRA, GRA, and RAs extensively proof the eligibility survey and enter the survey measures into our survey host.</li> <li>Protocols and databases developed for participant tracking and payment tracking.</li> </ul>
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Second Year	<ul style="list-style-type: none"> <li>Continuing to update our online resource and citation library via Mendeley.</li> <li>Consent forms approved by COMIRB.</li> <li>Drafts of emails to participants for full range of study contingencies (e.g., invites, reminders, non-eligible for study note, payments).</li> <li>Procurement card received by the project manager and all university-required trainings were completed.</li> <li>All gift card processes and custodianship maintained through year. Continue to work and maintain relationships with gift card vendors to ensure proper and timely payment to our participants.</li> <li>Creating processes to check and double check all data downloads from Qualtrics to SPSS; creating decision rules to ensure proper cleaning and sorting of data.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>Continuing to refine, maintain, and/or finalize all processes noted above.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>Continuing to refine, maintain, and/or finalize all processes noted above.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>Continuing to refine, maintain, and/or finalize all processes noted above.</li> </ul>

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Table 6. Recruitment.

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First Year	<ul style="list-style-type: none"> <li>Recruitment materials, such as sample text for advertisements, newspapers, banner ads, and flyers, created for our pre-review. Recruitment materials received pre-review approval from TATRC.</li> <li>Recruitment images selected and purchased.</li> <li>Recruitment materials received and approved by COMIRB.</li> <li>Hired a consultant/subcontractor from Colorado Springs who is familiar with local military to advise recruitment efforts.</li> <li>PRA expanding recruitment efforts to a national level to ensure adequate recruitment. Protocol revised to accommodate this and increased internet advertising and media pieces; submitted to COMIRB.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>Official study launch occurred on 06/17/13.</li> <li>In this year, our recruitment efforts included: <ul style="list-style-type: none"> <li>(a) online classified ads (including those that target the military population)</li> <li>(b) advertising on Army Wife Network, MilitaryWives.com, and Army Wife 101</li> <li>(c) Two separate blog postings on SpouseBuzz based on an interview with PI</li> <li>(d) circulation of an announcement for the study by Bill Coffin in various online military sites</li> <li>(e) posting the study in various psychological research, military, and couples sites</li> <li>(f) snowball sampling</li> <li>(g) direct outreach to FRGs, USOs, WRC, ACS, Chaplains</li> <li>(h) outreach to professional psychological organizations and military support organizations (e.g., ABCT- Military Psych Special Interest Group, Family Advocacy Program Coordinators, Yellow Ribbon Reintegration State Program Specialists, Family Readiness Division Coordinators/Liaisons; Military Family Research Institute, Military Suicide Research Consortium);</li> <li>(i) posting comments on related media articles</li> <li>(j) Facebook ads directed towards the population of our study and a Facebook page</li> <li>(k) Blue Star newsletter</li> <li>(l) news articles in Killeen Herald and on Military.com about our study with an interview from the PI</li> </ul> </li> </ul>
Third	<ul style="list-style-type: none"> <li>Complete. We continue to work to <u>retain</u> high levels of participation,</li> </ul>

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Year	including reminders and incentives to participate, responding to all participant questions, and ensuring timely completion of participant payments.
Fourth Year	<ul style="list-style-type: none"> <li>• Complete. Continue processes documented above.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>• Complete. Continue processes documented above.</li> </ul>

Table 7. Executing online surveys.

First Year	<ul style="list-style-type: none"> <li>• N/A this year.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>• The RAMP Project officially launched the eligibility survey on June 17, 2013.</li> <li>• As of March 1, 2014: 1531 individuals completed the eligibility screening, 500 (250 couples) individuals were fully qualified and have been sent Survey 1 invitations, 418 participants (including 199 matched couples) have completed Survey 1, 158 Survey 2 invitations have been sent (79 couples), 156 participants have completed Survey 2 (including 77 matched couples).</li> <li>• Examination of some eligibility responses continue to suggest that many of them are not valid responders, and therefore processes are continuing to be followed to screen out false responders.</li> <li>• Created processes to ensure survey response continuity across all surveys to screen out fraudulent responders.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>• As of March 1, 2015: A total of 1438 individuals (i.e., 719 couples) were fully qualified and were sent Survey 1 invitations. 1269 individuals (593 couples) have completed Survey 1. Survey 1 now completed. Survey 2 invitations sent to 281 couples. 271 couples have completed Survey 2. Survey 2 now completed. Survey 3 invitations sent to 550 individuals (i.e., 275 couples). 484 individuals (230 couples) have completed Survey 3. Survey 4 invitations sent to 152 individuals (i.e., 76 couples). 145 individuals (67 couples) have completed Survey 4.</li> <li>• Continue processes documented above for screening participants and checking data.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>• As of March 1<sup>st</sup>, 2016: 1432 individuals were fully qualified and have been sent Survey 1 invitations, 1267 individuals (593 matched couples) participated in Survey 1. 562 Survey 2 invitations sent (281 couples), 550 individuals (271 couples) participated in Survey 2. 556 Survey 3 invitations sent (278 couples), 524 individuals (248 couples) participated in Survey 3. 555 Survey 4 invitations sent (277 couples), and 517 individuals (238 matched couples) completed Survey 4. 516 Survey 5 invitations sent (258 couples), 456 individuals (210 matched couples) have completed Survey 5.</li> <li>• Continue processes documented above for screening participants and checking data.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>• After carefully screening data to further identify duplicate cases, fraud cases, and individuals who did not complete enough of the survey to be counted in responses, <i>final participation rates are as follows:</i> 1430 individuals (i.e., 715 couples) were fully qualified and sent Survey 1 invitations, 1242 individuals (576 matched couples) completed Survey 1. 554 Survey 2 invitations sent (277 couples), 537 individuals (263 matched couples) completed Survey 2. 554 Survey 3 invitations sent (277 couples), 519 individuals (224 matched couples) completed Survey 3. 553 Survey 4 invitations sent (276 couples), and 510 individuals (241 matched couples) completed Survey 4. 551 Survey 5 invitations sent (275 couples), 499 individuals (233 matched couples) completed Survey 5.</li> </ul>

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Table 8. Analysis and dissemination

First Year	<ul style="list-style-type: none"> <li>• N/A this year.</li> </ul>
Second Year	<ul style="list-style-type: none"> <li>• Poster abstract accepted at the Rocky Mountain Psychological Association (RMPA) 2014.</li> <li>• Three poster abstracts submitted to the Association of Behavioral and Cognitive Therapies (ABCT) 2014 conference.</li> </ul>
Third Year	<ul style="list-style-type: none"> <li>• An honors thesis based on the project was successfully defended and presented at the Rocky Mountain Psychological Conference.</li> <li>• Three sets of analyses were accepted and presented as posters at the 2014 ABCT conference.</li> <li>• See Appendix A, 1-4, below, for citations and abstracts for these four presented projects. Abstracts are from initial submission and do not represent final analyses for these studies.</li> <li>• Three poster abstracts and four symposium abstracts were submitted to the 2015 ABCT conference.</li> </ul>
Fourth Year	<ul style="list-style-type: none"> <li>• Received acknowledgment of acceptance and subsequently presented three poster abstracts and four symposium abstracts to the 2015 ABCT conference.</li> <li>• See Appendix A, 5-11, below, for citations and abstracts for these seven presented projects. Abstracts are from initial submission and do not represent final analyses for these studies.</li> <li>• Received acknowledgment of acceptance for four poster abstracts and one symposium presentation to the American Psychological Association (APA) 2016 conference.</li> <li>• Two symposium abstracts were submitted to the 2016 ABCT conference.</li> <li>• One poster abstract submitted for 2016 ISTSS conference.</li> </ul>
Fifth Year	<ul style="list-style-type: none"> <li>• Presented a talk and four posters at the American Psychological Conference in August, 2016.</li> <li>• Presented three posters and two talks at the ABCT Conference in October, 2016.</li> <li>• Presented a poster at the ISTSS Conference in November, 2016.</li> <li>• See Appendix A, 12-23, below, for citations and abstracts for these 11 presented projects. Abstracts are from initial submission and do not represent final analyses for these studies.</li> <li>• Submitted a manuscript to the Journal of Trauma and Dissociation in December, 2016.</li> </ul>

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#### Reportable Outcomes

Year 1: We provided training and experience to three compensated graduate students and one professional research assistant (who was an undergraduate at the University of Colorado Denver). We also provided training and experience to three volunteer undergraduate research assistants and have subcontracts with four co-investigators and three consultants.

Year 2: Employment or research opportunities based on experience/training supported by this grant included: training and experience to three compensated Graduate Students and one Professional Research Assistant (who graduated from University of Colorado Denver December 2014). We also provided training and experience to eleven volunteer undergraduate Research Assistants this year. We had subcontracts with four co-investigators and four consultants. As of March 1, 2014, 250 couples had been invited into the study.

Year 3: During year three, one poster was presented at the RMPA conference (Appendix A, 1), and three posters were presented at the 2014 ABCT conference (Appendix A, 2-4). Employment or research opportunities received based on experience/training supported by this grant included: training and experience to two compensated Graduate Students, training and experience to six volunteer undergraduate Research Assistants, and subcontracts with four co-investigators. As of March 1, 2015, 593 couples had completed Survey 1 and 271 couples had completed Survey 2. Data collection was ongoing for Surveys 3 and 4, and Survey 5 was ready to be launched in March 2015.

Year 4: During year four (1<sup>st</sup> NCE year), three posters and four symposium talks were presented at the 2015 ABCT conference (Appendix A, 5-11). Employment or research opportunities received based on experience/training supported by this grant included: training and experience to two compensated Graduate Students, training and experience to four volunteer undergraduate Research Assistants this year, and subcontracts with four co-investigators. As of March 1, 2016, 593 couples had completed Survey 1, 271 couples had completed Survey 2, 248 couples had completed Survey 3, and 238 couples had completed Survey 4. Data collection was ongoing for Survey 5.

Year 5: Year five (2<sup>nd</sup> NCE year) was our final year of the project. During this final year, we presented at three conferences: American Psychological Association (APA; one symposium and four posters; Appendix A, 12-16), ABCT (three posters and four symposiums; Appendix A, 17-21), and the International Society for Traumatic Stress Studies (ISTSS; one poster; Appendix A, 22). We also submitted one manuscript to the Journal of Trauma and Dissociation (Appendix 23). Employment or research opportunities received based on experience/training supported by this grant included: training and experience to two compensated Graduate Students, training and experience to one Research Assistant, and subcontracts with four co-investigators. The RAMP project officially ended on February 28, 2017. Final participation rates are as follows: 576 couples completed Survey 1, 263 couples completed Survey 2, 224 couples completed Survey 3, 241 couples completed Survey 4, and 233 couples completed Survey 5. Overall, we developed several measures for this study and our complete data collection will now allow us to test and refine them.

## Conclusions

This report highlights the progress and accomplishments during all five years of funding (March 2, 2012 to March 1, 2017) for the study: "Relationship Factors Contributing to the Progression of Combat Related PTSD and Suicidality Over Time" (known as the Relationships Among Military Personnel [RAMP] Project). The RAMP Project officially opened to participants on June 17, 2013 and our final participant completed Survey 5 on May 5, 2016. Our final sample consists of 576 couples in Survey 1, 263 couples in Survey 2, 224 couples in Survey 3, 241 couples in Survey 4, and 233 couples in Survey 5. Final response rates (on the individual level) for the 5 surveys are as follows: 87% for Survey 1, 97% for Survey 2, 94% for Survey 3, 92% for Survey 4, and 91% for Survey 5.

We received two no-cost extensions (NCE) over the course of the study, which extended the study period for an additional 24 months. We received continual annual approval from COMIRB and HRPO throughout the entire funding period. Over the five year study, we provided training, experience, and compensation to our Principal Investigator (PI), four subcontractors, two consultants, one Professional Research Assistant (PRA), and five Graduate Research Assistants (GRAs). We also provided training and experience to over 25 undergraduate research assistants (RAs), including CITI human subjects training, ethical and confidentiality training, weekly lab meetings, and supervision from study personnel.

Dissemination efforts included 15 presented posters and 7 presented talks at regional and national conferences, including American Psychological Association (APA), Association of Behavioral and Cognitive Therapy (ABCT), Rocky Mountain Psychological Association (RMPA), and International Society for Traumatic Stress Studies (ISTSS). See Appendix A, below.

Thank you for the opportunity to conduct this work and share our progress for the past five years. It has been an honor to strive to serve Army couples via this project. As we continue to analyze the responses from these hundreds of couples and share our results, we hope that the information will provide important knowledge regarding the experiences of Army couples and improve various types of prevention and intervention efforts.

## *Appendix Aa. Bibliography of all publications and meeting abstracts.*

**Note.** None of the projects below have been fully peer reviewed in manuscript form. Thus, results should be considered preliminary and exploratory. Data analysis for these projects spanned multiple years.

### **Appendix A1:**

#### *Citation:*

Glenn, D. A. & Allen, E., Renshaw, K., Fredman, S., Kenny, J., & Kern, C. (April and November, 2014). *Associations between numbing symptoms of PTSD and perceived burdensomeness among male Army service members: The role of partner support.* Poster presented at the 17th Annual Research and Creative Activities Symposium, University of Colorado, Denver and the meeting of the Association for Behavioral and Cognitive Therapies Convention, Philadelphia, PA.

#### *Poster abstract:*

PTSD symptoms, particularly emotional numbing, are associated with relationship distress (e.g., Taft, Schumm, Panuzio, & Proctor, 2008). Moreover, symptoms of PTSD are associated with a greater perception of being a burden, and again, this association is particularly strong for avoidance/numbing symptoms (Monteith, Menefee, Petit, Leopoulos, & Vincent, 2013). Importantly, a personal sense of being a burden on others is a risk factor for suicidal ideation and behavior (Joiner, 2005). Thus, understanding the link between PTSD and perceptions of burdensomeness is important. There are likely many factors which could help explain this association. The focus of the current study is to examine the extent to which a lower level of contribution to one's intimate relationship might mediate the association between PTSD-related avoidance/numbing and sense of oneself as a burden.

To address this question, the current study will analyze self-report data from Active duty Army males and their female civilian partners. These participants were recruited through general nationwide and military targeted advertising to participate in a larger online, longitudinal study. Couples had to be aged 18-65, English fluent, and in a long term relationship. Couples consisted of a female civilian partnered with a male who had a recent combat deployment while in the Army, Army Reserves, or Army National Guard. At this writing, 120 couples have been recruited; data collection is ongoing and it is anticipated that 200 couples will be available for analysis. Initial analyses confirmed the finding in the literature that, whereas all self-reported male PTSD clusters are associated with males' sense of self as a burden, the emotional numbing symptom cluster was most strongly related to burden. Specifically, correlations with a sense of burdensomeness were .35 for re-experiencing, .64 for emotional numbing, .37 for situational avoidance, and .50 for hyperarousal.

In this study, PTSD is measured with the PTSD Checklist (PCQ; Weathers, Litz, Herman, Huska, & Keane, 1993) and sense of self as a burden is measured with the perceived burdensomeness scale from the Interpersonal Needs Questionnaire (INQ; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Level of contribution to the intimate relationship will be operationalized by the degree to which the male reports that he provides social support to the female partner (based on the Support Provided scale of the Berlin Social Support Scales; BSS, Schulz & Schwarzer, 2004) and general items regarding how much the female partner reports that he contributes to parenting (when relevant) and domestic tasks. The female partner also provides a concurrent rating on a parallel measure of the social support that the male provides to her (the Support Received scale of the BSS), thus enabling us to evaluate the relative role of these two perceptions of his support.

A better understanding of the factors that contribute to a perception of oneself as a burden can help identify targets for intervention. This study will be particularly useful in increasing our understanding of the mechanisms of the link between PTSD and burden, and the dynamic interpartner perceptions of contributions to the relationship when emotional numbing symptoms are present.

### **Appendix A2:**

#### *Citation:*

Kenny, J. J., Allen, E., Fredman, S. J., Rhoades, G., Kern, C., Glenn, D. A. & Renshaw, K. (2014, April

and November). A comparison of male and female partner perceptions of accommodation to PTSD symptoms. Poster presented at the 17th Annual Research and Creative Activities Symposium, University of Colorado, Denver and the meeting of the Association for Behavioral and Cognitive Therapies Convention, Philadelphia, PA.

*Poster abstract:*

Between 10% and 18% of service members returning from OEF/OIF show significant signs of PTSD symptoms (Hoge et al., 2006). PTSD symptoms are associated with poorer relationship adjustment in military/veteran samples (e.g. Allen et al., 2009). This association is bidirectional, in that PTSD symptoms appear to increase relationship distress, but also that criticism and other negative behaviors by partners impede recovery from PTSD (Tarrier et al., 1999). Monson, Fredman, and Dekel (2010) have theorized that partners' altering their own behaviors in response to patients' PTSD symptoms to minimize patient distress or PTSD related relationship conflict may also have negative implications for the patient, the partner, and the couple's relationship adjustment. These behaviors, referred to as "partner accommodation to PTSD symptoms," have been operationalized in the form of a partner self-report questionnaire, the *Significant Others' Responses to Trauma Scale* (SORTS; Fredman et al., 2008). Greater accommodation is associated with partners' perceptions of patient PTSD severity, patient and partner depressive severity, and patient and partner anger and marital distress (Fredman et al., 2014). However, we lack knowledge regarding patient perceptions of these partner accommodating behaviors. To address this, we adapted the SORTS to assess trauma survivors' perceptions of their partners' accommodation to the survivors' own PTSD symptoms, the Perception of Significant Others' Responses to Trauma Scale (PO-SORTS). In a broader study of soldiers recently returned from deployment and their civilian partners, we gathered data on both the SORTS (from spouses/partners) and the PO-SORTS (from soldiers).

The first aim of this study is to determine psychometric adequacy of the PO-SORTS, following the same steps that Fredman et al. (2014) utilized in their validation of the SORTS (e.g. overall internal reliability and correlation with PTSD symptoms). The second aim of the study is to (a) compare the SORTS and the PO-SORTS in terms of factor structures and (b) examine concordance between patient and partner perceptions of partner accommodation to PTSD. This will allow us to see how the individuals' perceptions of ostensibly the same behaviors converge.

This study uses online survey data from a national sample of military couples in which the soldier has experienced a hardship deployment and is at risk for PTSD. Eighty couples have completed measures and with ongoing data collection we anticipate that an estimated sample of 300 couples will be available for analysis. Thus far, 50% of males in this sample have a PCL score of 30 or higher (PTSD Checklist; Weathers et al., 1993).

Results from this study will help to elucidate the cross-sectional concordance between patient and partner perceptions of partner accommodation. Continuing to use our on-going longitudinal data set, this research will help to elucidate the cross-sectional concordance between patient and partner perceptions of partner accommodation. Further, it will lay the groundwork for future research on the implications of accommodation and perceptions of accommodation for PTSD symptoms, suicidality, and relationship adjustment over time.

### **Appendix A3:**

*Citation:*

Kenny, J. J., Allen, E., Kern, C., Glenn, D. A. & Renshaw, K. (2014, April and November). *Advancing our understanding of the impact of physical injury on intimate relationships for military personnel*. Poster presented at the 17th Annual Research and Creative Activities Symposium, University of Colorado, Denver and the meeting of the Association for Behavioral and Cognitive Therapies Convention, Philadelphia, PA.

*Poster abstract:*

When a soldier returns home with war wounds, whether psychological, physical, or both, their relationships and families are impacted. While current research trends appear to be focused on the psychological and emotional stressors that returning from deployment may have on a soldier's

relationships (e.g. Allen et al., 2009), far less is known about the impact of a combat related physical injury on relationship functioning. MacDermid Wadsworth (2010) suggests that injury to a service member leads to potentially drastic changes in family roles and the overall emotional climate of the family. An increased understanding of how a combat injury may impact relationship dynamics is important.

Using male soldier responses to multiple questions about injury, including an open-ended question regarding the impact of injury on their relationship with their intimate female partner, we plan to identify themes that may aid in understanding of the specific dynamics of relationships that are affected by physical injury. This data is from a sample of military males who have endured a combat-related injury, drawn from a larger longitudinal sample of military males who are within 1 year of returning from a hardship deployment and have been in a serious relationship for at least a year. There are currently 168 participants, 30 (17.8%) of whom have endured a combat related injury. Recruitment is ongoing, and if we continue at a rate of 17.8%, we may have 60 or more in time for analyses. Of the current sample of 30 males, the mean age is 33, and 50% have a score of 36 or higher on the PTSD Checklist (PCL; Weathers et al., 1993). A total score of 30 or above is considered to be PTSD positive for the general population as well as military populations (Bliese, et al., 2008).

Coding will follow the recommendations of Hruschka et al. (2004), including segmentation of text, codebook creation, coding, initial assessment of reliability, codebook modification, and final coding with assessment of reliability. Preliminary results, based on the current sample of 30 soldiers, suggest themes such as increases in irritable mood, a lack of ability to fulfill household duties, no change in relationship, and/or increases in closeness and support (post-injury growth). Given that these questions were asked in the context of a rich longitudinal, dyadic (i.e. also including partner responses) dataset, we will be able to contextualize these responses in the larger social ecological framework.

The results of this study will contribute to the understanding of the impact of physical wounds on military relationships and aid in the future assessment of this area of reintegration. Clinically, this will help to bring awareness to other impacts of war that affect relationships aside from the psychological and emotional wounds. This will allow the field to provide more holistic and comprehensive clinical services to service men and their families upon return from deployment.

#### **Appendix A4:**

##### *Citation:*

Bhalla, A., Allen, E. S., & Renshaw, K. D. (2015, November). *An Initial Validation of the Post Deployment Couple Growth Inventory*. Poster session presented at the meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

##### *Poster abstract:*

Reintegration after military deployments can be a stressful time for military personnel and their partners, but may also be an opportunity for growth and resilience (De Burgh, White, Fear, & Iversen, 2011), similar to the construct of posttraumatic growth (PTG; Tedeschi & Calhoun, 1996). Qualitative research with military couples or spouses has verified these themes of relationship growth as a result of deployment, such as perceiving the relationship as stronger or more valuable (Knoblock & Theiss, 2014; Wick & Nelson-Goff, 2014).

Wick and Nelson-Goff (2014) identified posttraumatic growth as one out of five themes in their interviews with military couples. The researchers furthered sub-categorized these responses as individual PTG and relational PTG. Results showed a strong consistency across highly satisfied couples with low trauma symptoms with more reports of open communication, conflict management, role equality/satisfaction, support and nurturance, as well as identify relational PTG in response to deployment. Couples with low relationship satisfaction and high levels of trauma symptoms more often reported closed communication patterns, but were variable in reports of conflict management, role equality/satisfaction, support and nurturance, as well PTG, with some reporting relational growth and others reports individual growth. These results indicated the potential role of relational growth as a measure of dyadic resiliency and coping/meaning-making processes.

In response to their findings regarding individual and relational PTG in a study conducted with military couples, Wick & Nelson-Goff (2014) revised the Couples Adaptation to Stress (CATS) model

(Nelson-Goff & Smith, 2005) to include posttraumatic growth (individual and relational) as a measure of couple functioning. Wick & Nelson-Goff (2014) posited the importance of a better understanding of factors related to encouraging resilience and growth within military couples to incorporate into psychoeducational and treatment programs as a means of preventing negative effects of deployment and trauma.

The purpose of the current study was to develop and validate a quantitative scale to assess relational growth of military couples in response to deployment. Following prior literature, we focused the scale on themes of increased closeness, valuing the relationship, and increased trust and support. However, family reintegration after deployment can consist of both positive and negative dimensions simultaneously (Blais et al., 2009). Thus, we also wanted to measure the extent to which respondents felt that the deployment had decreased their investment or closeness in the relationship.

The resultant Post Deployment Couple Growth Inventory (PDCGI) was administered to a sample of 267 couples consisting of male soldiers and their female partners. All couples had gone through a military deployment together and male service members reported at least some level of PTSD symptoms related to their combat exposure. For the PDCGI, participants were asked to report on a 9-point scale the degree to which they experienced changes due to deployment (1 = *did not experience this change* and 9 = *very great degree*). For both males and females, an exploratory factor analysis (EFA) indicated the presence of a two-factor solution. The first factor was relational growth (e.g., "I realized how important my partner is to me"), and the second was relational decline (e.g., "I feel more distant from my partner"). Both factors showed very strong internal consistency for the males (growth  $\alpha = .93$ ; decline  $\alpha = .83$ ) and females (growth and decline  $\alpha = .93$ ). Both factors inversely correlated with each other for the males ( $r = -.38, p < .001$ ) and females ( $r = -.46, p < .001$ ). This is conceptually consistent with the scale content, but is not at the level that suggests redundancy. As further validation, relational growth predicted greater relationship satisfaction (males  $r = .58$ ; females  $r = .65$ ) and relational decline predicted lower relationship satisfaction (males  $r = -.64$ ; females  $r = -.69$ ). Thus, indices of reliability and validity were adequate.

Males and females did not differ from each other in levels of relational growth (paired  $t(266) = .60, p = .55$ ) or relational decline (paired  $t(266) = 1.93, p = .06$ ). Both males and females reported significantly greater relational growth (males  $M = 6.23, SD = 2.03$ ; females  $M = 6.15, SD = 2.11$ ) than decline (males  $M = 2.96, SD = 2.02$ , paired  $t(266) = 15.92, p < .001$ ; females  $M = 2.72, SD = 1.98$ , paired  $t(266) = 16.03, p < .001$ ). This suggests that the dominant pattern of relationship change, even in the context of some level of PTSD symptoms, is one of much greater closeness, investment, and trust with the partner. Further implications and future directions will be discussed.

## Appendix A5:

### Citation:

Paige, L., Renshaw, K.D., Allen, E., & Litz, B. (2015, November). *Types of deployment trauma predict help-seeking above and beyond severity of PTSD symptoms*. Poster session presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

### Poster abstract:

Although 14% of OEF/OIF service members ultimately develop posttraumatic stress disorder (PTSD) (Interian et al., 2012; Tanielian & Jaycox, 2008), only half of service members who need mental health treatment are willing to obtain it (Clark-Hitt et al., 2012). In fact, greater levels of PTSD are associated with *lower* treatment seeking (Marshall et al., 2006; Kehle et al., 2010); thus, those who need treatment most are least likely to seek it. Little research has examined whether specific types of deployment experiences contribute to this relationship. The present study investigated if the types of traumas experienced during deployment predicted willingness to seek treatment and actual receipt of treatment for PTSD, above and beyond PTSD severity.

The sample included 267 male, married Army soldiers deployed to Iraq/Afghanistan within the last 2 years, and screened for at least subclinical levels of PTSD. Participants reported on military-related PTSD symptoms, willingness to seek mental health treatment for PTSD if needed, and actual receipt of treatment for PTSD within the past 6 months. In addition, they indicated the frequency of four categories of trauma during deployment, based on categories proposed by Stein et al. (2012): (1) personal moral

injury (regret/guilt/shame from personal transgressions); (2) observed moral injury (witnessing or being victim to events that violated their morals); (3) threat (perceiving danger to their lives or lives of others); and (4) loss (witnessing/learning about the death of someone close).

We used linear regressions to predict willingness to seek help and logistic regressions to predict actual receipt of treatment. In both sets of analyses, independent variables were PTSD symptom severity, frequency of one type of trauma, and their interaction. Each type of trauma was tested separately, to preserve power and reduce multicollinearity.

In all analyses, PTSD severity was negatively associated with willingness to seek help but positively associated with having received treatment. Lower willingness to seek treatment was also predicted by greater frequencies of moral injury ( $\beta = -.22, p < .001$ ), observed moral injury ( $\beta = -.14, p < .01$ ), and threat ( $\beta = -.10, p < .05$ ). Furthermore, moral injury (interaction  $\beta = .18, p < .001$ ) and observed moral injury (interaction  $\beta = .18, p < .001$ ) moderated the association of PTSD severity with willingness to seek help, such that the association was near zero at higher levels of personal and observed moral injury. Together with the main effects of moral injury, this pattern indicated that those with greater personal or observed moral injury were less willing to seek help, regardless of PTSD severity.

Regarding actual receipt of treatment, only threat ( $OR = 1.44, p < .01$ ) and loss ( $OR = 4.63, p < .001$ ) accounted for additional variance beyond PTSD severity, with loss exhibiting a particularly strong effect. In addition, the interaction of loss and PTSD severity was significant ( $p < .01$ ), such that the association of PTSD severity and treatment receipt was near zero for soldiers reporting higher frequencies of loss. Together with the main effect of loss, this pattern reflected that soldiers who experienced loss were more likely to have received treatment, regardless of PTSD symptom severity.

## Appendix A6:

### Citation:

Kenny, J.J., Allen, E.S., Renshaw, K. D. (2015, November). *Does PTSD account for the entire relationship between combat experiences and family functioning in a military sample?* Poster presented at the 49th annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

### Poster abstract:

Paley et al. (2013) conclude that unique military family challenges such as deployment can take a toll on military marriages and children. Whereas combat related PTSD is reliably linked to negative marital and child outcomes, research on the impact of deployment and combat exposure on the family is mixed (de Burgh et al., 2011; Creech et al., 2014). After deployment, each service member completes a post-deployment assessment. To be flagged for a follow-up assessment or referral, the service member needs to screen positive on desire for assistance and/or concerns about self-harm, loss of control, depression, or acute stress/PTSD. Thus, reports of certain combat risks or exposures are not flagged for referral. However, some research has found that trauma and threat experienced during deployment are powerful predictors of mental health outcomes (Cigrang et al., 2014; Litz et al., 2004). Therefore, it is important to understand if perceived threat and combat exposure, in addition to PTSD, may impact the family. Thus, our goal is to determine if there is an independent influence of threat and combat exposure during deployment on family functioning over and above self-reported PTSD.

This study uses online survey data from a national sample of 359 male service members and their civilian wives who have at least one child over the age of 2. The males completed the PTSD Checklist (Weathers et al., 1993) and the Combat Exposure (amount of exposure), Deployment Concerns (amount of perceived exposure to danger), and Post-Battle Experience (amount of graphic experiences after battle) subscales of the Deployment Risk and Resiliency Inventory (DDRI-2; Vogt et al., 2013). Wives reported on their youngest children's behaviors using the Strengths and Difficulties Questionnaire (Goodman et al., 1997). Both service members and wives completed the Couples Satisfaction Index (Funk et al., 2007).

Results indicate that the three DDRI-2 scales were all significantly correlated with one another and with PTSD (all  $ps < .01$ ). However, the DDRI-2 scales were not significantly correlated with child outcomes or female relationship distress (all  $ps > .05$ ), and the only DDRI-2 scale that was significantly correlated with male relationship distress was the Deployment Concerns subscale ( $r = .12, p = .01$ ). As reliably found elsewhere, PTSD significantly predicted child outcomes ( $r = .11, p = .04$ ) and both female

( $r = .19$ ,  $p = .00$ ) and male ( $r = .29$ ,  $p = .00$ ) relationship distress. However, only the Deployment Concern subscale accounted for unique variance in male relationship distress over and above PTSD ( $\beta = .13$ ,  $\Delta R^2 = .02$   $p = .00$ ).

Results replicate the direct effect of the male service members' PTSD on family functioning, but evidenced no direct effects of service member combat exposure, perceived danger, or graphic experiences on child behavior or female partner relationship distress. Only perceived exposure to danger during deployment showed direct effects on male relationship distress, over and above the severity of the male service member's PTSD. Overall, this suggests that screening for more detailed deployment factors may not add much incremental validity for family assistance referrals.

#### **Appendix A7:**

Bhalla, A., Allen, E. S., & Renshaw, K. D. (2015, November). *An Initial Validation of the Post Deployment Couple Growth Inventory*. Poster presented at the 49<sup>th</sup> annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

##### *Poster abstract:*

Reintegration after military deployments can be a stressful time for military personnel and their partners, but may also be an opportunity for growth and resilience (De Burgh, White, Fear, & Iversen, 2011), similar to the construct of posttraumatic growth (PTG; Tedeschi & Calhoun, 1996). Qualitative research with military couples or spouses has verified these themes of relationship growth as a result of deployment, such as perceiving the relationship as stronger or more valuable (Knoblock & Theiss, 2014; Wick & Nelson-Goff, 2014). The purpose of the current study was to develop and validate a quantitative scale to assess relational growth of military couples in response to deployment. Following prior literature, we focused the scale on themes of increased closeness, valuing the relationship, and increased trust and support. However, family reintegration after deployment can consist of both positive and negative dimensions simultaneously (Blais et al., 2009). Thus, we also wanted to measure the extent to which respondents felt that the deployment had decreased their investment or closeness in the relationship.

The resultant Post Deployment Couple Growth Inventory (PDCGI) was administered to a sample of 267 couples consisting of male soldiers and their female partners. All couples had gone through a military deployment together and male service members reported at least some level of PTSD symptoms related to their combat exposure. For the PDCGI, participants were asked to report on a 9-point scale the degree to which they experienced changes due to deployment (1 = *did not experience this change* and 9 = *very great degree*). For both males and females, an exploratory factor analysis (EFA) indicated the presence of a two-factor solution. The first factor was relational growth (e.g., "I realized how important my partner is to me"), and the second was relational decline (e.g., "I feel more distant from my partner"). Both factors showed very strong internal consistency for the males (growth  $\alpha = .93$ ; decline  $\alpha = .83$ ) and females (growth and decline  $\alpha = .93$ ). Both factors inversely correlated with each other for the males ( $r = -.38$ ,  $p < .001$ ) and females ( $r = -.46$ ,  $p < .001$ ). This is conceptually consistent with the scale content, but is not at the level that suggests redundancy. As further validation, relational growth predicted greater relationship satisfaction (males  $r = .58$ ; females  $r = .65$ ) and relational decline predicted lower relationship satisfaction (males  $r = -.64$ ; females  $r = -.69$ ). Thus, indices of reliability and validity were adequate.

Males and females did not differ from each other in levels of relational growth ( $t(266) = .60$ ,  $p = .55$ ) or relational decline ( $t(266) = 1.93$ ,  $p = .06$ ). Both males and females reported significantly greater relational growth (males  $M = 6.23$ ,  $SD = 2.03$ ; females  $M = 6.15$ ,  $SD = 2.11$ ) than decline (males  $M = 2.96$ ,  $SD = 2.02$ ,  $t(266) = 15.92$ ,  $p < .001$ ; females  $M = 2.72$ ,  $SD = 1.98$ ,  $t(266) = 16.03$ ,  $p < .001$ ). This suggests that the dominant pattern of relationship change, even in the context of some level of PTSD symptoms, is one of much greater closeness, investment, and trust with the partner. Further implications and future directions will be discussed.

#### **Appendix A8:**

##### *Citation:*

Kenny, J. J., Allen, E.S., Fredman, S. J., Renshaw, K. D. (2015, November). Two Perspectives on Accommodation: Partners vs. Service Members. In S. J. Fredman (Chair), *Partner Accommodation of PTSD Symptoms in Military and Veteran Couples*. Symposium conducted at the 49th annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

*Symposium abstract:*

Partner accommodation to patient PTSD symptoms is associated with patient PTSD symptoms and both patient and partner distress (Fredman et al., 2014). However, we lack knowledge regarding the patients' own perceptions of their partners' accommodating behaviors. We thus adapted the *Significant Others' Responses to Trauma Scale* (SORTS; Fredman & Monson, 2008) into the *Perception of Significant Others' Responses to Trauma Scale* (PO-SORTS) to assess service members' perceptions of their partners' accommodation to the service members' PTSD symptoms. Male service members with at least subclinical PTSD and their female partners ( $N = 268$  couples) completed the measures.

The PO-SORTS showed excellent internal consistency ( $\alpha = .91$ ) and a strong correlation with partners' scores on the SORTS ( $r = .42$ ), with no significant differences in reported frequency of partners' accommodating behavior. Similar to the SORTS (Fredman et al., 2014), the PO-SORTS correlated highly with service members' reported PTSD symptoms ( $r = .65$ ), and both service members' and partners' marital distress ( $r = .27$  and  $.18$ , respectively), depression ( $r = .52$  and  $.18$ , respectively), and hostility ( $r = .53$  and  $.21$ , respectively) (all  $p \leq .05$ ). However, when controlling for depressive, hostility, and PTSD symptoms, only the SORTS (not the PO-SORTS) accounted for significant variance in both service member (SORTS:  $\beta = -.16$ ,  $\Delta R^2 = .02$ ,  $p = .01$ ; PO-SORTS:  $\beta = -.04$ ,  $\Delta R^2 = .00$ ,  $p = .64$ ) and partner (SORTS:  $\beta = -.51$ ,  $\Delta R^2 = .13$ ,  $p = .00$ ; PO-SORTS:  $\beta = -.06$ ,  $\Delta R^2 = .00$ ,  $p = .30$ ) relationship satisfaction. Thus, female partners' perceptions of their own accommodating behaviors feature more prominently in both partners' relationship satisfaction.

Finally, service members' distress regarding their partners' accommodation was moderately correlated with partners' distress regarding their own accommodation ( $r = .36$ ,  $p = .00$ ). However, despite similar reports of frequency of accommodation, female partners endorsed significantly more distress about their accommodation than service members ( $t[1,267] = 3.61$ ,  $p = .00$ ). Thus, in this context, accommodation overall is more distressing to the person engaging in accommodation than to the person being accommodated.

The PO-SORTS appears to be psychometrically sound and correlates with a range of individual and marital adjustment measures. Although partners generally agree on the frequency of accommodating behaviors, their reports have differing correlates. Clinical implications for working with couples in which one partner has elevated symptoms of PTSD will be discussed.

**Appendix A9:**

*Citation:*

DiMauro, J., Renshaw, K. D., & Allen, E.S. (2015, November). Associations of PTSD and discrepancies between partner reports of support provided and soldier reports of support received. In J. DiMauro & K.D. Renshaw (Co-Chairs), *Social support and PTSD: Empirically-based extensions of current knowledge*. Symposium conducted at the annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, Illinois.

*Symposium abstract:*

Despite the documented link between perceived support and PTSD severity, minimal research has looked beyond survivors' perceptions to others' reports of provided support. Because self-report measures may reflect an actual lack of support or a biased perception, it may be important to also assess perceptions of the individuals *providing* support to survivors. In a sample of over 500 male, married Army soldiers with a combat deployment in the last 2 years, we examined self-reports of support received from partners, as well as partner reports of support provided.

Reports of support provided and received were only modestly correlated ( $r = .27$ ,  $p < .001$ ). Partners reported providing higher levels of support ( $M = 104.47$ ,  $SD = 11.41$ ) than soldiers reported receiving ( $M = 85.24$ ,  $SD = 15.33$ ),  $t(563) = 27.69$ ,  $p < .001$ . We thus created a discrepancy variable by subtracting soldier-reported support received from spouse-reported support provided. In a linear regression of PTSD

symptoms, greater soldier perceived support predicted lower levels of PTSD ( $\beta=-.13, p<.05$ ), and greater discrepancy in reports (partner reporting more support than soldier) predicted greater levels of PTSD ( $\beta=.18, p<.01$ ). Moreover, in a subsample of 267 soldiers with at least subclinical PTSD at baseline, only the discrepancy ( $\beta=.20, p<.05$ ) predicted levels of PTSD 1 to 2 months later (in the same direction). Of note, spouse report of support provided exerted no significant direct effects in any analyses – it was only significant in the context of discrepancy with soldier support.

Given the potential importance of support discrepancy, we examined couple communication and satisfaction as correlates. Only soldiers' report of communication problems ( $\beta=-.28, p<.001$ ), not partners' ( $\beta=-.03, p=.454$ ), predicted the discrepancy. Also, soldiers' ( $\beta=-.51, p<.001$ ) and partners' ( $\beta=-.10, p<.05$ ) reports of couple satisfaction were both significantly predictive of the discrepancy, with the greater the discrepancy, the lower the relationship satisfaction. As is evident from these results, soldiers' reports accounted for much more variance. Thus, support discrepancy appears tied primarily to soldiers' perceptions of the relationship.

These results suggest the discrepancy between provided and perceived support may be an important factor in understanding the overall associations of support with PTSD severity. Considering perceived support alone may provide an incomplete picture of the interpersonal dynamic involved in support within intimate relationships. Implications for research and clinical work in this area will be discussed.

## Appendix A10:

### Citation:

Renshaw, K. D., Allen, E. S., Fredman, S. J., & Kern, C. (2015, November). Spouses' reasons for accommodation of service members' PTSD symptoms: Links with symptom clusters and overall levels of accommodation. In S. J. Fredman (Chair), *Partner accommodation of PTSD symptoms in military and veteran couples*. Symposium presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

### Symposium abstract:

Emerging research reinforces the importance of partner accommodation in the interpersonal context of posttraumatic stress disorder (PTSD). A better understanding of partners' reasons for accommodation can help us refine or design interventions that target accommodation. To explore reasons for accommodation, we assessed 267 male Army soldiers who (a) deployed to Iraq/Afghanistan within the last 2 years and (b) screened positive for at least subclinical levels of PTSD, as well as their female partners. Soldiers completed a measure of combat-related PTSD. Partners completed the Significant Other Response to Trauma Scale (SORTS), which assesses frequency of accommodation and level of accompanying distress, and the Reasons for Accommodation Scale (RFAS), a newly developed measure.

RFAS items used a scale from 1 (*not at all a reason*) to 7 (*very much a reason*). Principal axis factoring with oblimin rotation yielded a clear, 3-factor solution for the RFAS that accounted for 56% of the variance. The factors represented accommodating for the following reasons: (1) Facilitating Avoidance (FA; 5 items,  $\alpha=.86$ ), or a belief that avoidance was helpful for the service member, (2) Good Intentions (GI; 10 items,  $\alpha=.92$ ), or an altruistic desire or sense of responsibility to help the service member, and (3) Conflict Avoidance/Helplessness (CAH; 10 items,  $\alpha=.92$ ), or a desire to avoid conflict or simply not knowing what else to do. Mean score on GI ( $M=3.81, SD=0.10$ ) was significantly higher than FA ( $M=2.69, SD=0.09$ ), which was significantly higher than CAH ( $M=2.49, SD=0.09$ ).

All 3 factors were correlated with soldiers' PTSD ( $r_s=.25-.29$ ) and partners' accommodation ( $r_s=.40-.77$ ). A path analysis predicting the three factors by soldiers' PTSD symptom clusters ( $\chi^2[9]=6.87, p=.764$ ; RMSEA=.00) revealed that the re-experiencing cluster predicted FA ( $b=.26, p<.001$ ), the hyperarousal cluster predicted GI ( $b=.33, p<.001$ ), and the emotional numbing cluster predicted CAH ( $b=.22, p<.001$ ), with no other significant associations. In a saturated model predicting partners' accommodation frequency and distress by the three factors, CAH exhibited strong associations with both outcomes ( $b=.70, p<.001$ ;  $b=.79, p<.001$ ), with FA weakly associated with accommodation frequency ( $b=.17, p=.003$ ) and all other paths nonsignificant.

Partners accommodate PTSD symptoms for a variety of reasons, and these are differentially related to specific PTSD symptom clusters. The data also suggest that actual levels of accommodation are most strongly connected to attempts to avoid conflict or feeling helpless.

## **Appendix A11:**

### *Citation:*

Carter, S., Renshaw, K. D., & Allen, E. (2015, November). Concurrent and prospective associations of support from romantic partner with interpersonal suicide risk factors in service members. In S. Carter (Chair), *Mechanisms of suicide risk in the context of military service members and veterans*. Symposium conducted at the annual meeting of the Association for Behavioral and Cognitive Therapies, Chicago, IL.

### *Symposium abstract:*

Research has made significant strides in identifying risk and protective factors for suicidal ideation and behavior, but less is known about the mechanisms underlying these factors. The interpersonal psychological theory posits that perceived burdensomeness (PB) and thwarted belongingness (TB) are key risk factors for suicide (Van Orden et al., 2010). Few studies, however, have evaluated interpersonal phenomena in relation to TB and PB. Support from romantic partners is likely to be associated with reduced TB, but there is potential for high levels of support to paradoxically contribute to a greater sense of being a burden (i.e., PB). The present study examined 270 male service members' (SMs') reports of support from their female partners and partners' report of support provided in relation to SMs' reports of PB and TB, both cross-sectionally and prospectively.

SMs had been deployed to Iraq/Afghanistan within the past 2 years and reported at least subclinical symptoms of PTSD. At baseline, SMs completed a measure of support from partners, and partners completed a measure of support provided to SMs. SMs also completed measures of TB and PB at baseline and again 1-2 months later. A path analysis of SM support received and partner support provided predicting SMs' TB and PB at T2, controlling for TB and PB at T1, provided good fit ( $\text{RMSEA}=.055$ ,  $\text{CFI}=.996$ ). SM support received was negatively associated with TB ( $r=-.54$ ,  $p<.001$ ) and PB ( $r=-.42$ ,  $p<.001$ ) cross-sectionally, and also with TB ( $b=-.13$ ,  $p=.010$ ), but not PB, prospectively ( $b=-.08$ ,  $p=.105$ ). Partner report of support provided was not directly related to TB or PB at either time point, but it did moderate the association of SM support received with PB at T2 ( $b=.12$ ,  $p=.015$ ). There was a negative association of support with PB, but it grew weaker as partner report of support provided increased. In other words, when spouses perceived that they provided greater support, SM perception of support was less protective against PB.

As predicted, the more the SM experienced support from the partner, the greater their sense of belonging, both cross-sectionally and over time. However, the pattern was less clear with the partner report of support provision. SM report of support received was negatively associated with PB, but the longitudinal association was significant only when partners reported *lower* support provision. Thus, receiving support from the partner did not show the posited paradoxical effect of increasing perceived burden, but the moderation effect of partner support provision warrants further exploration.

## **Appendix A12:**

### *Citation:*

Allen, E., Renshaw, K., Fredman, S., Rhoades, G., Markman, H., Stanley, S., & Litz, B. (August, 2016).

The Interplay of Soldier PTSD Symptoms and Dyadic Accommodation with Interpersonal Risk for Suicide. In Blais, R. (Chair), *Suicide in the Military: The Relational Context of a Leading Cause of Death in Service Members*. Symposium presented at the 124th American Psychological Association Annual Convention, Denver, CO.

### *Symposium abstract:*

According to the Interpersonal Theory of Suicide, perceiving oneself as a burden to others and a sense of failed belonging are predictors of suicidal intent. The current project examines processes within military marriages that, over time, may exacerbate or protect against increases in perceived burdensomeness and failed belonging in men who have served in the US Army and have symptoms of PTSD.

Data will be drawn from the Relationships Among Military Personnel (RAMP) project. In the RAMP project, 275 couples comprised of male service members with baseline PTSD symptoms and their female civilian wives complete surveys at five assessment points over 18 months, starting after the male's return from deployment. Longitudinal data collection is in progress and will be complete in May 2016. Surveys include measures of service members' PTSD, perceived burdensomeness and belonging, and reported provision of support to wives, as well as both partners' perception of wives' "accommodation" of PTSD (e.g., taking over tasks and avoiding social interactions that may cause PTSD-related distress for the service member) and both partners' relationship distress. We hypothesize that service member PTSD will lead to subsequent increases in partner accommodation and decreases in service member provision of support to partners, which in turn will predict greater relationship distress in both partners and greater perceived burdensomeness and failed belonging in service members.

Analyses for the current paper will utilize hierarchical linear modeling and/or path analysis to conduct autoregressive cross-lagged analyses of the longitudinal data. Preliminary results from cross-sectional analyses with baseline data are consistent with hypotheses. For example, there are significant direct and indirect effects (via lower provision of support from the service member and greater accommodation from the wife) of service member PTSD on perceived burden. Results will strongly inform interventions for military couples struggling with PTSD and potential risks for suicide.

### **Appendix A13:**

#### *Citation:*

Bhalla, A., Allen, E.S., Kenny, J.J., Fredman, S., Renshaw K.D., & \*Soberay, K. (2016, August). *The Role of Experiential Avoidance in Partner Accommodation and Service Member PTSD*. Poster presented at the 124th American Psychological Association Annual Convention, Denver, CO.

#### *Poster abstract:*

Experiential avoidance (EA) is a core component of the Acceptance and Commitment Therapy (ACT) model of psychopathology (Luoma, Hayes, & Walser, 2007). EA concerns the notion that psychological issues arise from active avoidance of unwanted internal experiences (Bond et al., 2011). Research has demonstrated a link between a measure of EA and PTSD symptoms in civilian (Kashdan, Morina, & Priebe, 2009; Marx & Sloan, 2005) and OEF/OIF veteran (Meyer et al., 2013) samples. Recent studies have begun to shed light on the concept of accommodation in couples where one member has PTSD (Fredman et al., 2014). Accommodation behaviors are acts that may involve reinforcement of avoidance by colluding with the traumatized individual's avoidance of distressing stimuli (e.g., doing a distressing task for them, or encouraging them to avoid "triggers"). Previous research has shown that greater partner accommodation is associated with greater service member's (SMs) PTSD symptoms (Kenny et al., 2015). When EA is high, there may be an even stronger signal to the partner to also avoid and accommodate SM avoidance. Thus, for the current study, we hypothesize that SM's EA would moderate the association between the female partner's perception of the SM's PTSD (sPCL) and their level of accommodation to SM PTSD, wherein the link between PTSD and accommodation will be stronger at higher levels of EA.

The current study will utilize data from the fifth survey of the Relationships Among Military Personnel (RAMP) project, which surveys 266 couples, consisting of male SMs and their female civilian intimate partners. Virtually all couples included in the study screened positive for some level of SM PTSD symptomatology at baseline.

Final analyses are pending as RAMP is currently finishing data collection for the fifth survey (scheduled for completion in May 2016). In the current sample of couples who have completed the fifth survey ( $n = 84$ ), all three variables (sPCL, EA, and accommodation) demonstrated moderate to large intercorrelations with each other. In the overall model containing sPCL, EA and their interaction term predicting accommodation, the interaction term was non-significant and thus moderation was not detected. However, we do anticipate almost 200 more couples will complete the survey. For the final presentation, the analysis will be based on the complete sample with adequate power. Regardless of the final results, clinical implications and future directions will be discussed in the final poster presentation.

### **Appendix A14:**

*Citation:*

Bhalla, A., Allen, E.S., Renshaw K.D., Fredman, S., & Kenny, J.J. (2016, August). *Accommodation to PTSD symptoms as a Predictor of Caregiver Burden in Female Partners of Service Members*. Poster presented at the 124th American Psychological Association Annual Convention, Denver, CO.

*Poster abstract:*

Past research has illustrated the emotional distress and perceived burden experienced by female partners of service members (SMs) with posttraumatic stress disorder (PTSD; Calhoun et al., 2002; Caska & Renshaw, 2011; Maguno-Mire et al., 2007). Providing emotional and behavioral support for the SM has been previously linked with higher caregiver strain (NAC, 2010; Ramchand et al., 2013). In one study, SMs' psychological symptoms (e.g., PTSD, depression, and anxiety) significantly predicted perceived caregiver burden above and beyond characteristics of the female partner (e.g., coping styles, self-efficacy, and neuroticism). However, SMs' psychological symptoms still accounted for less than 10% of the variance of the spouse's perceived caregiver burden, leaving the possibility that other spousal characteristics account for a significant portion of perceived caregiver burden (Caska & Renshaw, 2011).

Most of this research focuses on the link between partner burden and SM PTSD symptoms (from SM own report or partner's perception). However, partners can respond to PTSD (and its manifestations) in a variety of ways. Accommodation to PTSD is one type of response associated with greater SM PTSD, as well as individual and relationship distress (Kenny et al., 2015). Specifically, partners may accommodate to the service members' PTSD symptoms by doing a distressing task for them, encouraging them to avoid painful stimuli, or other behaviors which reinforce avoidance. Over time, this could further increase their sense of burden in caring for their partner.

To explore this hypothesis, the current study utilizes data from the Relationships Among Military Personnel (RAMP) project, which surveyed 277 couples, consisting of male SMs and their female civilian intimate partners. Two time points were examined due to little prior examination of longitudinal predictors of military caregiver burden. Virtually all couples included in the study screened positive for some level of service member PTSD symptomatology at Time 1 (T1).

Bivariate correlations among all study variables were all significant, yet accommodation to PTSD was a stronger correlate of caregiver burden ( $r = .71$ ) than SM self-reported PTSD ( $r = .27$ ). In fact, the magnitude of the correlation between accommodation and burden suggests that these two constructs are highly overlapping.

Results of a multiple regression with SM PTSD symptoms and partner accommodation from T1 predicting caregiver burden at Time 2 (T2) showed that accommodation still strongly predicted caregiver burden ( $\beta = .70$ ,  $p < .001$ ), above and beyond PTSD symptoms ( $\beta = .05$ ,  $p = .23$ ). Therefore, it may be that helping partners respond differently to SM PTSD can greatly reduce their sense of burden. Interventions such as Cognitive Behavioral Couples Therapy for PTSD (Monson & Fredman, 2012), which address these types of accommodation patterns and provide partners with alternate ways of effectively engaging with the SM, may have direct impacts on caregiver burden over time.

**Appendix A15:**

*Citation:*

Kenny, J.J., Allen, E., Bhalla, A., Soberay, K. & Renshaw, K. D. (2016, August). *Partner caregiver chronic pain predicts caregiver burden above and beyond service member PTSD*. Poster presented at the 124<sup>th</sup> annual convention of the American Psychological Association. Denver, CO.

*Poster abstract:*

Caregiver burden is conceptualized as the negative impact on one's emotional and physical health, social functioning, and financial status due to their caregiving role (Zarit, Todd, & Zarit, 1986). Several studies have linked higher PTSD severity with greater experience of partner burden (e.g., Caska & Renshaw, 2011; Mira et al., 2010). However, despite considerable research linking caregiver burden

with PTSD, the conditions under which the experience of burden is relatively high or low remain largely unknown, particularly in military couples. Caska and Renshaw (2011) found that caregiver coping style predicted caregiver burden above and beyond Service Member (SM) PTSD. However, PTSD only accounted for 10% of the variance in caregiver burden. Thus, there may be other characteristics of partners, such as their own stressors, that may help to explain their sense of burden in caring for their SM. One important stressor may be partner's own chronic pain. Military caregivers experience a high level of physical strain that appears to be greater than the general caregiving population (40% vs 14%; NAC, 2010). In one study of military caregivers, the majority (63%) of the respondents reported "strains, aches, or pains" (NAC, 2010). Given the dual nature of pain being both a sensory and an emotional experience (Merskey & Bogduk, 1994), it could be that caregiver chronic pain could add additional variance in predicting the partner's sense of burden.

To address this question, we analyzed online survey data from 280 male SMs, back from deployment within two years, and their civilian female partners. 96% of couples are married and 77% have children. The males completed the PTSD Checklist (PCL; Weathers et al., 1993;  $\alpha = .95$ ). The females completed two questions about their own chronic pain: "how much is your life disrupted by chronic pain?" (1 = *not at all*; 7 = *extremely*) and "how much pain are you generally in?" (0 = *not at all*; 9 = *worse pain imaginable*). These two items were summed to create an overall index of pain. The female partners also completed a self-report measure of their own caregiver burden (Zarit et al., 1980;  $\alpha = .95$ ).

Partner report of perceived caregiver burden was significantly correlated with both SM report of PTSD and partner report of chronic pain ( $p < .01$ ). Results indicate that partner report of pain significantly predicted partner burden ( $\beta = .14$ ,  $p < .05$ ), above and beyond SM report of PTSD ( $\beta = .29$ ,  $p < .01$ ). Thus, it may be that partner chronic pain exacerbates the partner's sense of burden in caring for her SM partner, perhaps due to her feeling obligations to care for the SM while also dealing with her own pain. Results of this study may aid in the reintegration process for service members and their partners who are experiencing chronic pain. It may also help clinicians conceptualize couples they are working with where one person has PTSD and the other has chronic pain.

## Appendix A16:

### Citation:

Soberay, K. A., Allen, E., Kenny, J. J., & Bhalla, A. (2016, August). *Links between chronic pain and the interpersonal psychological theory of suicide in Soldiers*. Poster presented at the 124th American Psychological Association Annual Convention, Denver, CO.

### Poster abstract:

**Background:** Suicides in the military have steadily increased since 2001, with the active duty suicide rate rising by 140% from 2008 to 2012 (U. S. Department of Defense, 2014). Chronic pain is a suicide risk factor that is understudied in military populations, despite service members and veterans' increased likelihood for both chronic pain and suicide. The interpersonal-psychological theory of suicidal behavior (IPTS; Joiner, 2005) explains that an individual will not die by suicide unless both the desire to die by suicide and capability exists. The theory posits that individuals acquire the capability for self-injury over time through exposure to painful and provocative experiences, whereas the desire to die is influenced by failed belongingness and perceived burdensomeness. Research supports that combat exposure increases acquired capability for suicide and that chronic pain is positively associated with perceived burdensomeness and thwarted belonging (Bryan et al., 2010; Wilson et al., 2013). However, further research is needed to understand if chronic pain, in addition to or beyond combat exposure, relates to acquired capability and how chronic pain increases likelihood for perceived burden and thwarted belongingness.

**Methods:** The current study explores the effects of chronic pain on acquired capability for 608 male soldiers (mean age = 31.2, SD = 5.85) and whether chronic pain predicts acquired capability above combat exposure. In addition, we tested if mood, stress, and substance use mediate the effects of chronic pain on thwarted belongingness (TB) and perceived burdensomeness (PB).

**Results:** Pain was a significant predictor of acquired capability after controlling for combat exposure ( $\beta = .08$ ,  $p = .04$ ). Chronic pain was also a significant predictor of PB ( $\beta = .26$ ,  $p < .001$ ) and TB ( $\beta = .17$ ,  $p < .001$ ), as found in prior research. Surprisingly, in this sample, pain did not predict alcohol use and

predicted lower levels of drug use ( $\beta = -.10$ ,  $p = .01$ ) and thus, these were not tested as mediators. However, pain predicted greater depression ( $\beta = .27$ ,  $p < .001$ ) and stress ( $\beta = .27$ ,  $p < .001$ ). Stress and depression partially mediated the relation between pain and PB. Stress and depression mediated the relationship between pain and TB.

**Conclusions:** Prior research has established that chronic pain is a suicide risk factor. In this study, pain significantly predicts acquired capability for suicide above level of combat exposure. The association between chronic pain and the other factors suggest that suicide may be an attempt to escape not only physical pain, but also the perceived burden and thwarted belonging experienced as a result of chronic pain and its effects on mood and stress. It is important that military and veteran behavioral health specialists understand and discuss with patients the reasons why chronic pain may be linked to their risk of suicide. This will allow the specialists and the service member or veteran better understand their risk for suicidal thoughts and behaviors and determine appropriate interventions.

## **Appendix A17:**

### *Citation:*

Allen, E. S., Renshaw, K. D., & Fredman, S. J (2016, October). Mothers' Parental Buffering in the Context of Husband PTSD. In S. J. Fredman (Chair), Partnering and parenting in the presence of PTSD. Symposium presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

### *Symposium abstract:*

Service member PTSD symptoms are associated with poorer parenting and child outcomes (Creech et al., 2014; Knopp et al., 2016), but few studies have explored specific ways that partners adapt their parenting in the context of service member PTSD. To investigate this phenomenon, we developed a new measure to explore how the wives of Army soldiers strive to (a) buffer the children from the effects of soldiers' PTSD symptoms and (b) decrease the chances that children will exacerbate soldiers' symptoms. This measure was tested in a sample of 175 Army couples with at least one child in the home.

Factor analysis revealed two primary factors, which were highly correlated with one another ( $r=.79$ ) but demonstrated distinct factor loadings and associations with specific variables. The first factor (*Withdrawal Buffering*) focused on husband withdrawal symptoms (e.g., "I felt like I had to soothe, reassure, or protect my kids from my partner's withdrawal or detachment"; 5 items,  $\alpha = .94$ ). The second factor (*Anger Buffering*) focused on husband anger (e.g., "The kids came to me with their needs because of my partners' anger or irritability"). Additional items on this factor included feeling protective of the children, making sure the children did not upset the husband, and anxiety regarding the husband and children upsetting each other (9 items,  $\alpha = .96$ ). Thus, "walking on eggshells" experiences in parenting loaded higher with husband anger than with husband withdrawal.

Both *Withdrawal Buffering* and *Anger Buffering* was significantly predicted by wives' perception of greater husband hypervigilance symptoms, controlling for all other PTSD symptoms ( $\beta = .34$ ,  $p < .001$ ). However, the most robust associations were found for husband numbing symptoms: after controlling for all other PTSD subscales, both husband and wife report of husbands' numbing predicted wives' *Anger Buffering* and *Withdrawal Buffering* behaviors ( $\beta$ s ranging from .31 to .62, all  $p < .05$ ).

Greater levels of both types of buffering were also associated with significantly lower self-reported closeness with the children and greater levels of punitive parenting from both husbands and wives. Thus, it does not appear that this pattern of buffering behavior is associated with compensatory closeness and positivity with children for mothers; instead, it appears to be part of a constellation of problematic relations with children for both parents.

## **Appendix A18:**

### *Citation:*

Renshaw, K. D., Thomas, S., & Allen, E. S. (2016, October). PTSD symptoms and parenting in service member and their partners. In S. J. Fredman (Chair), Partnering and parenting in the presence of PTSD. Symposium presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

*Symposium abstract:*

PTSD symptoms are related to poorer parenting behaviors and lower parenting alliance in service members (SMs) after deployment (Allen et al., 2010; Creech et al., 2014; Gewirtz et al., 2010). Surprisingly little research, however, addresses the association of SMs' PTSD symptoms with their partners' parenting. As a first step in addressing this gap, we evaluated the effects of SMs' PTSD symptoms on both SMs' and partners' parenting, as well as the influence of partners' depression in these associations.

The sample consisted of 425 military couples (male SMs and female partners) with at least 1 child in the home. All SMs had deployed within the past 2 years. SMs completed the PTSD Checklist (PCL), and partners completed the Depression Anxiety Stress Scale – Depression subscale (DASS-D). Both partners completed the Parenting Alliance Inventory (PAI) and the Alabama Parenting Questionnaire – Short Form (APQ-9), which measures parenting behaviors in 3 domains: positive parenting (PP), inconsistent discipline (ID), and poor supervision (PS).

We used path analysis (with bootstrapping, using 5,000 resamples) to evaluate direct and indirect paths of PTSD to parenting outcomes for SMs and partners. SM PTSD was modeled as a predictor, partner depression was modeled as a mediating variable, and the parenting scores (4 for SMs and 4 for partners) were modeled as outcome variables. Covariances were included among all 8 of these outcomes. Paths were specified from SM PTSD to partner depression and all 8 parenting outcomes, and from partner depression to the 4 partner parenting outcomes.

Model fit was excellent ( $NFI = .99$ ;  $RMSEA = .02$ ). Total effects of PTSD were significant for both SM and partner PAI ( $b = -.24, -.13$ ) and both SM and partner ID ( $b = .17, .14$ ), but nonsignificant for SM and partner PP ( $b = -.03, .04$ ) and SM and partner PS ( $b = .06, -.04$ ). For partners, PTSD exerted 2 significant direct effects to PAI ( $b = -.11$ ) and ID ( $b = .12$ ), and 3 indirect effects (using bias-corrected percentiles) to PAI ( $b = -.02$ ), ID ( $b = .01$ ), and PP ( $b = -.01$ ).

These results indicate that SMs' PTSD has negative effects on partner parenting that closely parallel those on SMs' own parenting, with significantly lower parenting alliance and significantly greater inconsistent discipline in both. Moreover, although PTSD exerted significant indirect effects (through partners' depression) on 3 of 4 indices of partners' parenting, the direct effects of PTSD on partner PAI and ID remained significant. Thus, PTSD appears to exert effects on partner parenting beyond effects on partners' own mental health.

**Appendix A19:**

*Citation:*

Paige, L., Renshaw, K. D., & Allen, E. S. (2016, October). The role of posttraumatic cognitions in the association between traumatic events and PTSD symptoms. Poster session presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

*Poster abstract:*

For over two decades, research has demonstrated that negative cognitions play a key role in the development and maintenance of PTSD (Beck, Jones, Reich, Woodward, & Cody, 2015; Davis et al., 2016; Karl, Rabe, Zöllner, Maercker, & Stopa, 2009; Shahar, Noyman, Schnidel-Allon, & Gilboa-Schnectman, 2013). However, fairly little research has focused on the unique contributions of different types of traumas to these posttraumatic cognitions. Until recently, trauma research within the military context has traditionally focused on the role of life threatening events in the development of posttraumatic stress symptoms (Armstrong, Bilsky, Zhao, & Olatunji, 2013; Huang & Kashubeck-West, 2015; Mcfall, Fontana, Raskind, & Rosenheck, 1999). However, the stressors that service members experience during deployment are diverse (Stein et al., 2012), and may uniquely influence post-trauma functioning. Thus, the present study aimed to investigate the direct and indirect effects of varying types of deployment trauma on posttraumatic cognitions and PTSD.

The present sample consists of 266 male, married Army soldiers deployed to Iraq/Afghanistan within the last 2 years, and screened for at least subclinical levels of PTSD. At one time point, participants reported the frequency of four categories of potentially traumatic events during deployment, based on categories proposed by Stein et al. (2012): (1) committed moral injury (committing acts that led to

regret/guilt/shame); (2) observed moral injury (witnessing or being victim of events that violated their morals); (3) threat (perceiving danger to their lives or lives of others); and (4) loss (witnessing/learning about the death of someone close). At a second time point, 1 to 2 months later, participants reported on posttraumatic cognitions and military-related PTSD symptoms.

Using macros from Preacher & Hayes (2008), we investigated the direct and indirect (via posttraumatic cognitions) effects of the frequency of the four types of traumas on PTSD symptoms. Experience of loss was the only trauma type to have a significant direct effect on PTSD ( $p < .01$ ), with frequency of threat-related events approaching significance ( $p = .XXX$ ). Committed moral injury emerged as the only trauma type to exert a significant *indirect* effect on PTSD ( $p < .05$ ). In line with this finding, moral injury was the only trauma type to demonstrate a significant effect on posttraumatic cognitions ( $p < .0001$ ).

Overall, in a multivariate analysis, committing moral injury was the primary driver of posttraumatic cognitions, which in turn predicted PTSD. Effects of loss (and, to a lesser degree, threat) on PTSD were observed, but these effects did not occur through elevations in negative posttraumatic cognitions. These results reinforce the significance of negative cognitions in the aftermath of trauma. Furthermore, they suggest that these cognitions may contribute to the development of PTSD for certain types of traumas more than others.

## Appendix A20:

### Citation:

Summers, C. B., Renshaw, K. D., Stewart, J. L., Ledoux, A. M., & Allen, E. S. (2016, October). Sleep quality predicts relationship satisfaction beyond PTSD symptoms. Poster session presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

### Poster abstract:

Extensive research shows that symptoms of posttraumatic stress disorder (PTSD) are associated with relationship distress in service members (SMs) and their partners (e.g., Lambert et al., 2012; Taft et al., 2011). PTSD symptoms have also been strongly linked with sleep problems (e.g., Borders et al., 2015; Wright et al., 2011). Although emerging research highlights sleep problems as potentially important in understanding relationship quality (Meadows & Arber, 2015), little research has yet examined whether sleep problems help explain the link between PTSD symptoms and relationship satisfaction. The aims of the current study were to: (1) explore actor and partner effects of sleep quality on relationship satisfaction in SMs and partners, while accounting for SMs' PTSD symptoms, and (2) determine whether poor sleep quality accounts for some of PTSD's association with poorer relationship satisfaction.

The sample consisted of 410 male SMs within 2 years of deployment to Iraq/Afghanistan, and their female spouses/partners. The couples were part of a larger project that recruited military couples online, with rigorous verification of service and data validation protocols. SMs' mean age was 31.2 years old ( $SD = 5.90$ ), and partners' mean age was 30.31 years old ( $SD = 6.03$ ). SMs reported on PTSD symptoms, and both SMs and partners reported on sleep quality and relationship satisfaction.

In a bootstrapped path analysis (with 5,000 resamples) PTSD symptoms, SM sleep quality, and partner sleep quality were modeled as predictors of both SM and partner relationship satisfaction (thus addressing aim #1). In addition, we included paths from PTSD to both SMs' and partners' sleep quality, to evaluate indirect effects of PTSD on relationship satisfaction via sleep quality. Assessing direct and indirect effects of PTSD addressed aim #2. As we included covariances between SM and partner sleep quality and between SM and partner relationship satisfaction, the model was saturated and did not generate model fit indices. Bias-corrected estimates and confidence intervals were used to evaluate the study aims.

PTSD was significantly related to poorer sleep quality in SMs ( $b = -.56$ ) and partners ( $b = -.12$ ). In regard to aim#1, sleep quality demonstrated significant actor *and* partner effects on relationship satisfaction for both soldiers *and* partners (all  $bs > .13$ ). In regard to aim #2, PTSD had significant, negative direct effects on relationship satisfaction in SMs ( $b = -.20$ ) and partners ( $b = -.10$ ), as well as significant, negative indirect effects (via poorer sleep quality) on relationship satisfaction for both SMs ( $b = -.11$ ) and partners ( $b = -.12$ ).

These results suggest that poor sleep quality is a significant factor in the association of PTSD symptoms and relationship satisfaction in military couples. Sleep quality in both individuals play a role in relationship satisfaction for both individuals. Also, although direct causality cannot be assumed, it appears PTSD symptoms may contribute to impaired sleep, which in turn may contribute to poor relationship satisfaction. Interventions targeting sleep problems for both SMs and partners may be beneficial to relationships of SMs with post-deployment PTSD symptoms.

### **Appendix A21:**

#### *Citation:*

Thomas, S. A., Renshaw, K. D., Allen, E. S., & Stewart, J. L. (2016, October). Post- deployment parenting in service members and their partners. Poster session presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

#### *Poster abstract:*

Symptoms of post-traumatic stress disorder (PTSD) in service members (SMs) are associated with poorer parenting practices and a lower parenting alliance after deployment (Allen et al., 2010; Gewirtz et al., 2010). Surprisingly little is known, however, about the partner's parenting experience in the post-deployment environment, especially in relation to SMs' PTSD symptoms. SMs' PTSD symptoms are associated with greater psychological and marital distress in partners (Lambert et al., 2012), and such negative effects could come with detrimental impacts on parenting. However, empirical research on this issue is needed. As a first step toward filling this gap, the present study seeks to identify the impact of the SM's PTSD on the partner's report of parenting behaviors and the parenting alliance. We expect the partner's experience of parenting and perception of the parenting alliance will be negatively impacted by increased PTSD symptom severity in the SM.

The sample consisted of 425 male SMs who had deployed within the past 2 years, and their female partners. All couples had at least 1 child in the home. SMs completed the PTSD Checklist (Weathers et al., 1993). Both partners completed the Parenting Alliance Inventory (PAI; Abidin & Bruner, 1995) and the Alabama Parenting Questionnaire- Short Form (APQ-9; Elgar et al., 2007), which measures parenting behaviors in 3 domains: positive parenting, inconsistent discipline, and poor supervision.

We ran a path analysis with SMs' PTSD symptoms modeled as a predictor of all 4 parenting measures for both SMs and partners (eight outcome variables total). Paths predicting each set of SM and partner parenting variables were constrained to be equal (e.g., the path from PTSD to SM PAI was constrained to be equal to the path from PTSD to partner PAI; the path from PTSD to SM positive parenting was constrained to be equal to the path from PTSD to partner positive parenting, etc.). The model provided an excellent fit to the data,  $\chi^2(4) = 5.21$ ,  $p = .266$ ; CFI = .997; RMSEA = .027. The paths to SM and partner PAI were significantly negative ( $p < .001$ ), and the paths to SM and partner inconsistent discipline were significant positive ( $p < .001$ ). Paths to positive parenting ( $p = .606$ ) and poor supervision ( $p = .766$ ) were nonsignificant.

These results offer some of the first empirical evidence that SMs' PTSD can detrimentally impact partners' parenting. As predicted, PTSD symptoms were associated with a decreased parenting alliance and more inconsistent discipline for *both* members of the couple (although results for poor supervision and positive parenting were nonsignificant). Moreover, the effects on partners' parenting outcomes were statistically equivalent to effects on SMs' outcomes. These data highlight the importance of further study into the partner's parenting to better understand the family environment with PTSD. It is possible that children in these families are doubly disadvantaged, as both parents might be struggling with parenting in addition to other PTSD-related problems. Continued research could ultimately lead to improved interventions for military couples and more positive family and child outcomes.

### **Appendix A22:**

#### *Citation:*

Summers, C., Carter, S., Renshaw, K., & Allen, E.S. (2016, November). *Sleep Quality Accounts for Some of the Association between Service Members' PTSD Symptoms and Partners' Depression*. Poster

to be presented at the 32<sup>nd</sup> annual meeting of the International Society for Traumatic Stress Studies in Dallas, TX.

*Poster abstract:*

Romantic partners of service members (SMs) with PTSD report elevated psychological distress. Considering the prevalence of sleep problems in both PTSD and depression, the current study sought to explore how sleep quality may help explain the association of SMs' PTSD with partners' depression.

SMs (n=399) who deployed within the past 2 years reported on PTSD symptoms and sleep quality, and their romantic partners rated their own sleep quality and depression symptoms. In a bootstrapped path analysis, PTSD symptoms, SM sleep quality, and partner sleep quality were modeled as predictors of partner depression, and PTSD symptoms were also modeled as predictors of SM and partner sleep quality. The path from SM sleep to partner depression was nonsignificant ( $p = .206$ ), and a model without this path provided excellent fit ( $\text{RMSEA} = .039$ ). In this model, PTSD was significantly associated with SM ( $b = -.56$ ,  $p < .001$ ) and partner ( $b = -.13$ ,  $p = .008$ ) sleep. Also, the direct effect of SM PTSD on partner depression was nearly significant ( $b = 0.10$ ,  $p = .053$ ), and the indirect effect of SM PTSD on partner depression via partner sleep quality was significant ( $b = .05$ ,  $p = .004$ ).

Sleep problems may be a significant, understudied mechanism of the link between SM PTSD and partner depression. Sleep-focused interventions may help to improve psychological health of partners of SMs with PTSD symptoms.

**Appendix A23:**

*Citation:*

Bhalla, A., Allen, E. S., Renshaw, K.R., Kenny, J., & Litz, B.L. (Under Review). Emotional numbing symptoms partially mediate the association between exposure to potentially morally injurious experiences and sexual anxiety for male service members. *Journal of Trauma & Dissociation*.

*Manuscript abstract:*

Service members (SMs) returning from deployment are at risk of a range of sexual problems, some of which are thought to be related to psychological issues that may arise during deployment or combat. The current study sought to examine whether exposure to potentially morally injurious events (PMIEs) was associated with sexual anxiety, above and beyond combat exposure, and whether any such association was mediated by PTSD symptoms. These questions were tested using data from self-report surveys collected from 221 partnered male Army (Active Duty, National Guard, or Reserve) SMs' at three separate time points. Findings showed that exposure to PMIEs was significantly related to greater sexual anxiety, with transgressions by self and perceived betrayal demonstrating unique associations when controlling for all factors of PMIEs. Moreover, exposure to PMIEs was associated with sexual anxiety even when controlling for general combat exposure. PTSD symptoms partially mediated the association between exposure to PMIEs and sexual anxiety, with emotional numbing accounting for significant unique indirect effects after controlling for other PTSD symptom clusters. The findings suggest that exposure to PMIEs is associated with sexual anxiety, even accounting for either combat exposure or PTSD symptoms, emphasizing the importance of this phenomena in understanding post-deployment problems in sexual intimacy.

*Appendix B. List of personnel receiving pay (not including salaries/stipends) from the research effort.*

1. Principal Investigator:  
Dr. Elizabeth S. Allen (University of Colorado Denver, 2012 – 2017)
2. Sub-contractors / Co- Principal Investigators:  
Dr. Keith Renshaw (George Mason University, 2012 – 2017)  
Dr. Galena Rhoades (University of Denver, 2012 – 2017)  
Dr. Scott Stanley (University of Denver, 2012 – 2017)  
Dr. Howard Markman (University of Denver, 2012 – 2017)  
Dr. Brett Litz (Boston VA Research Institute, Inc., 2012 – 2017)  
Dr. Steffany Fredman (Pennsylvania State University, 2012 – 2017)
3. Consultants:  
Sharon Stone (2012 – 2013)  
Judy Davis (2013 – 2015)
4. Professional Research Assistant, University of Colorado, Denver:  
Catherine Kern (2012 – 2014)
5. Graduate Research Assistants, University of Colorado, Denver:  
Catherine Jayne (C.J.) Bathgate (formerly Kalinka) (2012 – 2013)  
Aaron Spence (2012)  
Christian Somoza (2012 – 2013)  
Jessica Kenny (2013 – 2017)  
Arjun Bhalla (2014 – 2017)